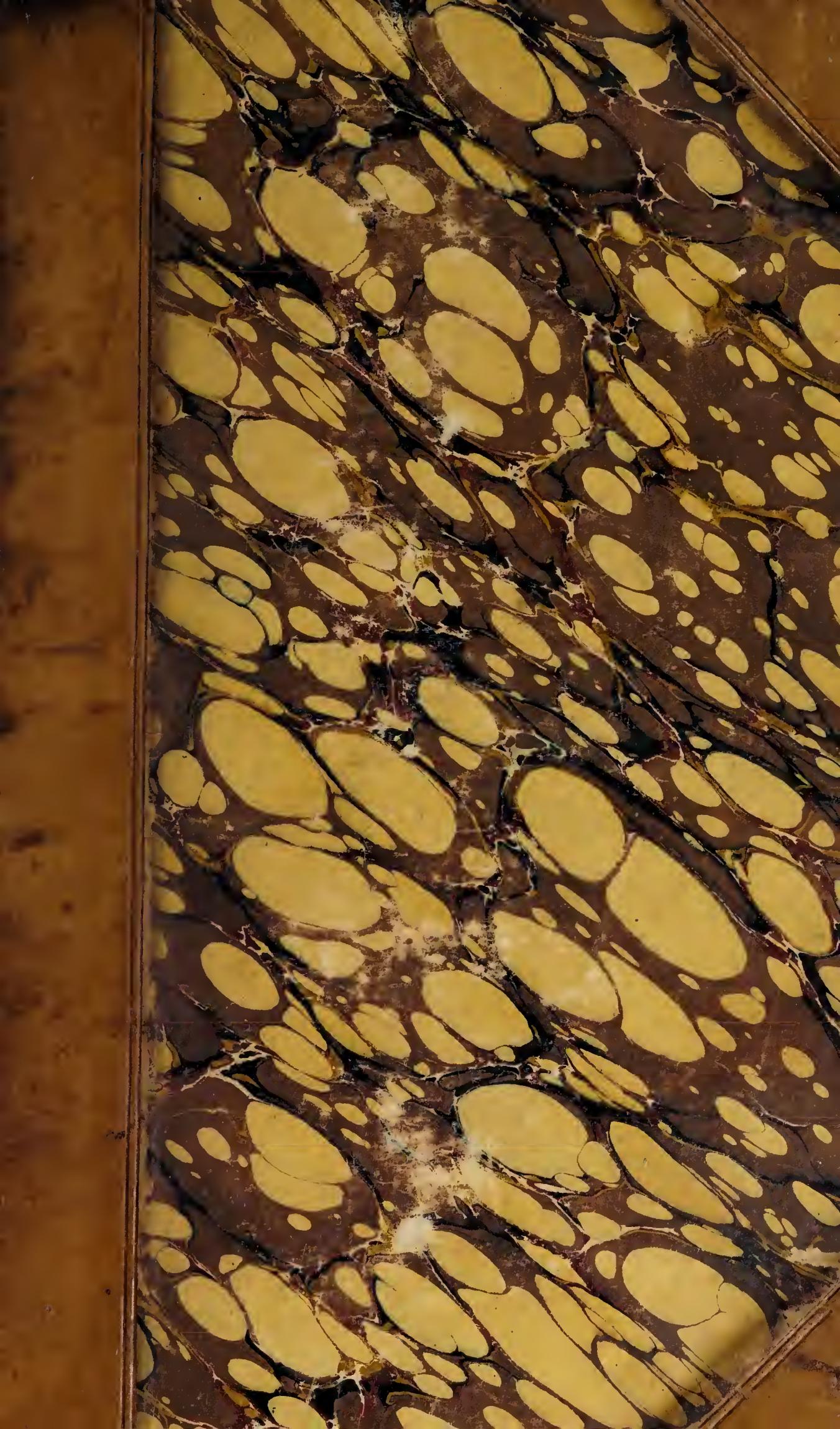

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TRANSACTIONS.

TRANSACTIONS

OF THE

ARCHITECTURAL INSTITUTE OF SCOTLAND.

FIRST SESSION.

1850-51.

VOLUME FIRST.

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INAUGURAL ADDRESS

DELIVERED AT THE

FIRST ANNUAL GENERAL MEETING

OF THE

ARCHITECTURAL INSTITUTE OF SCOTLAND,

IN THE

Hopetoun Rooms, Edinburgh,

28TH NOVEMBER 1850.

THE RIGHT HONOURABLE THE EARL OF MORTON,

ONE OF THE VICE-PRESIDENTS, IN THE CHAIR.

BY THE

REV. JAMES GRANT, D.D.

MINISTER OF ST MARY'S, EDINBURGH.

EDINBURGH:

PRINTED BY W. BURNESS,

Printer to Her Majesty.

1850.

Transactions of the Architectural Institute of Scotland.
Session 1850-51.

No. I.

INAUGURAL ADDRESS

BY

THE REV. JAMES GRANT, D.D.
OF ST MARY'S, EDINBURGH.

My Lord Morton and Gentlemen,

I think I am fully warranted in considering the occasion of our present meeting as a very interesting one, but I must be allowed to express my fear that the interest attaching to it may be lessened, instead of being increased, by the unfortunate selection of myself for the duty which I now, with no little diffidence and reluctance, proceed to perform. My only comfort in performing it is derived from the consideration, that the very selection by the Council of so humble an individual, and one confessedly so partially acquainted with the art, the cultivation of which it is their object to promote, seems to warrant the belief that they regard the duty as rather formal than otherwise in its character, and do not expect to be furnished either with solid instruction in a science which is foreign to the chief pursuit of my life, or with any eloquent and heartstirring appeal, such as my limited powers are altogether unequal to.

Architecture is at once the chief of the mechanical sciences, and one of the fine arts, yielding to no other in the interest and attractiveness of its principles, and the useful and practical character of its productions. It is the view

taken by us of this importance and attractiveness that has led to the establishment of the Institute, which we have this evening met to inaugurate. We venture to think that the art, confessedly useful and interesting as it is, has been favoured only in niggard measure with those adventitious aids that have been more freely bestowed on others, and that it merits, and ought to enjoy, the advantages which may be derived from a distinct and separate association formed in its behalf—which, uniting the now divided efforts of its professors and admirers, may lead to its occupying a higher position —to a more general cultivation, and a more liberal encouragement of the architectural art—and to an elevation of the general standard of taste in architectural matters. I do not wish to indulge in over sanguine anticipations, but I may be allowed to express my hope that the goodly array of members—some of them men of great influence and accomplishment—who have already enrolled their names, is at once a pledge that the operations of the Society will be conducted with spirit and energy, and an earnest of the good-will and support of the more general public.

I have said that Architecture is at once one of the most important, and one of the most attractive and interesting, of those arts that address themselves to the imagination. It is practically important, as being directly subservient to human convenience and accommodation, and essential alike to the refinements of luxury and the more ordinary comforts of civilized life. But there is, besides this, an interest attaching to it, derived from a great variety of sources, some of them common to it with other branches of art, and others altogether, or nearly so, peculiar to itself. I do not venture to discuss the question, whether there are certain proportions that are essentially and necessarily beautiful—whether there is a natural and infallible standard by which to judge of architectural productions, as a musical ear does

of the relation between sounds; but it cannot be denied that these productions do in fact exhibit (whencesoever derived) beauty, grandeur, and sublimity, in a high degree—that they open up a wide, and, indeed, unlimited field for the display of contrivance and skill—that they form subjects for the gratifying exercise of the purest and most cultivated taste—and that they have employed the efforts, and embody the conceptions, of the very highest order of intellect and genius. The art is of the very earliest origin—coeval, it may be said, with the very existence of our race,—for its intervention was necessary for the comfort and protection of man in his most primitive condition; and it has been associated with his growth in wealth, power, science, commerce, and religion, in every age, accompanying his progress from the very infancy to the full development of civilization. From the substantial and costly character of its productions, requiring often for their accomplishment the expenditure even of national wealth, its great standards have been less variable, and its great principles more fixed, than those of arts that minister to mere passing taste and fashion. And, lastly, from the enduring materials of which its works have been composed, ever since the rude hut and the moveable tent gave place to more substantial erections, monuments of the art are every where to be found of great and often unknown antiquity. In some others of the arts, ancient nations, now swept away, have attained to the highest excellence, but the works they achieved in them have perished with themselves. The finest work on canvass is comparatively soon lost to the world, but this art has raised monuments which have defied for ages the wasting hand of time—which have resisted the ravages of war and the destroying violence of barbarism, and stand forth to this day proud relics of bygone years, guiding the taste, and ministering to the enjoyment, not of one only, but of a thousand generations.

It were needless to say in how many ways this feature of the architectural art invests it with interest beyond almost every other. Hence it is that, in the study of it, we can start with peculiar advantages, for it admits of a handing down in some measure of all the improvements of the art from generation to generation, even as general knowledge is handed down in written language. Hence it is that, even as we have preserved to us the immortal and invaluable literary productions—the poetry and eloquence and philosophy—of enlightened Greece—so we have also the Temple of Minerva, exhibiting the very essence of Grecian taste, still crowning the Acropolis of Athens, and attesting the glories of the age of Pericles;—that, as we have the songs of the Mantuan bard, and the classic eloquence in which Tully spake, we have also the Pantheon, a glorious relic of the Augustan age, and the columns and triumphal arches of the Empire, the remains of Roman grandeur that still adorn the city of the Cæsars. How wide, then, the school in which the art may be learned! How extended the field of study! How varied and numerous the models to chasten and improve the taste! Some nations, it is true, once flourishing, have, after fulfilling their destiny, been swept away "like the baseless fabric of a vision;" and even their architectural monuments have not escaped the desolation that has overtaken their government and polity. The great cities of the Assyrian empire have perished almost as utterly as the doomed "cities of the plain;" and of the Temple on Mount Zion, in the language of sacred song, "beautiful for situation, the joy of the whole earth," not one stone is left upon another. But, generally speaking, throughout the world, monuments of architectural skill and genius are to be found wherever civilization has once held sway, though now they may be but memorials of a glory that has departed. The field of the enlightened architect's study, then, is the wide world.

Nor is the durability of architectural works, as compared with those of other arts, the materials of which are more perishable, valuable and interesting only as affording models for the study of the art. It tends directly to stimulate the efforts, and heighten the ambition of its professors. In the exercise of some other arts, the artist, however lofty and sublime his conceptions, and however perfect his execution, can only minister to the taste and enjoyment of at most a few generations, and his fame must be confined within a comparatively narrow field. In this he may raise monuments of enduring fame, that will outlive the very existence of the nation and society to which he belongs. Such trophies of genius, as I have said, still remain in Athens, amid all the changes of which that country has been the scene ; and Rome is still glorious for her monuments of early art. In Persia and Hindostan there still exist works of great magnificence, and of a very remote age, and remains of cities that, in extent, wealth, and splendour, appear to have far exceeded the greatest of the western world. The ruins of Palmyra, " Tadmor of the wilderness," with its Temple of the Sun, its palaces, and its porticoes, in the highest style of decorative Roman art, still remain, though in the midst of a desert, and among a barbarous people—a proof at once of the permanence of architectural works and of the instability of earthly grandeur. Though the glory of the land watered by the Nile—the nursery of early art and science—hath long since passed away, Upper Egypt is yet covered by unrivalled structures, which, in spite of changes of dynasty, and hostile violence, and the wasting influence of three thousand years, form the magnificent and indestructible remains of a once powerful and learned people, though their origin and history are unknown. And though the usurped dominion of the Moors hath ceased in the peninsula of Southern Europe—though the infidel intruders have been

expelled, and have long since returned to comparative barbarism, the Palace of the Alhambra and the Mosque of Cordova yet attest to the wondering visitor the taste, grandeur, and civilization to which the swarthy race had attained. Nay, nearer home, in our own isle, there still exist specimens of the art that have escaped the destroying hand of time, whose erection was coeval at least with the early civilising influence of true religion.

Nor are the monuments of Architecture that remain of importance and interest to the professor and amateur student of the art alone; they are of stirring interest to the philosopher, the historian, the archæologist—to all who cultivate ethnical science, and would be acquainted with nations and ages that have passed away. I have already said that Architecture has been associated with the progress of wealth, and power, and civilization, and religion in every age; it has been influenced by the state of knowledge, and by climate, and by political change; it has always formed one of the distinctive features of a people. Its works, then, are the enduring records on which are legibly inscribed the history and character, and peculiar genius, and prevalent ideas, of every nation, whether still existing, or that has ceased to be. It has been well said that "the scale of a nation's civilization is denoted by its works of art, its columns, its porticoes, and its statuary." Suppose, then, that we take a survey of Egypt. It is the most ancient country in the world; it was the cradle of science, and the first seat of regular government; it was old even in the infancy of Greece, and had reached the consummation of its grandeur before the commencement of the earliest European civilization. But the materials we derive from history to guide our inquiries regarding its wonderful people are very scanty, and there are many blanks which history does not fill up. It is chiefly from its architectural monuments that our knowledge must be derived; and they afford much to

instruct and guide us. We see the originality of their art in the simplicity of its outlines. In the uniformity that pervades their structures, as well as the ornaments of them, we can trace the control of a despotic power steadily and systematically restraining individual conception and effort. From the similarity between their early architecture and that of the people of Western India, we can infer the intercourse between them and the probable identity of race. We can see the traces of various ages and dynasties, and their architecture, at first magnificent, but comparatively rude, at a later period becoming somewhat more refined through the insensible influence of Greek and Roman art. If we go to Thebes, celebrated even by the father of epic poetry, we shall, by her magnificent ruins, best judge of the glories of the Thebaid, and see at once the distinct marks of a priestly dynasty, and the remains of an age of surpassing pristine splendour. If we wish to trace the sources of Moorish civilization as developed in Spain, our best, and perhaps only, guide will be the study and analysis of the Saracenic style. If we watch the interesting operations of the indefatigable Layard while he disinters a former world, we shall best judge, by the monuments he uncovers, of the history, the civilization, the tastes and habits, the power, magnificence, and splendour, of the mighty people that once dwelt on the Tigris and Euphrates. In judging of the character of the Greeks and Romans we have the aid of written history, but their peculiarities and their progress are nowhere better seen than in their architectural monuments. In these, we see the former people gradually advancing in judgment, skill, and discriminating taste—not affecting originality, but borrowing and improving on every model to which they had access—not seeking to give dignity to their art from mere magnitude and the application of labour, but from simplicity, fitness, and proportion, and making it the subject of original genius and generous rivalry, not tram-

melled by despotism, but encouraged by free institutions. In the multitude and variety of their temples we see the proof that, in the words of the Apostle, with all their refinement and philosophy, they were "too superstitious." Looking to the monuments of Roman art, we can trace the gradual refinement, through the influence of Greece, of the rude conqueror of the world. We see her ardent, though misguided, piety. We behold the palaces and temples on which genius, sacrificing to vanity or superstition, lavished her most glorious efforts. We turn to her magnificent aqueducts, and see the noblest record of the civilization of the imperial city—an instance of the polite arts made subservient, not merely to the taste and pleasures of the few, but to the happiness of a nation—to the comfort and well-being of the many. If we examine the productions of the art scattered over the surface of Europe, we shall thereby be able to trace the progress of modern civilization from its first early dawn. In the castles and strongholds that overspread every land in the palmy days of feudalism, we shall see a faithful picture of the then state of society—the prevalence of rapine, and violence, and petty tyranny, and the absence of every effectual restraint in the shape of general law and authority; and, in the introduction of a new and splendid style of building into the Western World, we may mark the influence of the crusades and other intercourse with the East. If we confine ourselves to England, we may, in her architectural works, trace her history and progress—we shall find some remains of the old Saxon dynasty—we shall see the changes introduced by the Norman conquest, the influence of the glorious Elizabethan age, and the subsequent return to the purity of Roman taste. In short, among the great moral landmarks of every people, are their monuments of architectural art. On these (in many cases when their writings are irrecoverably lost) are inscribed their history, their manners, their religion—the extent of com-

merce they enjoyed—the measure of power, and civilization, and wealth, to which they had attained. How wide a field, then, does this science open up to all for rational amusement —for profitable study—for interesting discovery—for the cultivation and refinement of taste—for the enlargement of useful knowledge. Nor is this all. One of the greatest charms of the art consists of some of the associations inseparably connected with it. It is associated, first of all, with our early classical recollections of enlightened Greece, and its extraordinary people; and of Rome, great and glorious, whose eagle strengthened her wing, and took her flight o'er half the globe, and which, after enslaving Greece, sat admiringly at her feet to learn art and wisdom. Their works of architectural taste and skill, not less than their languages and their literature, retain everywhere an acknowledged pre-eminence. They have stood the test of enlightened criticism in every age. It is not merely that they have on them the seal of hoar antiquity, but they are admitted standards of excellence, from which, by the common consent of the civilized world, all appeal is excluded. You will, I am sure, anticipate me when I add that the noble art is invested with a yet more sacred and hallowed interest, as inseparably associated with the sanctities of religion and the piety of bygone times. It is not that, whether we look to the East, or to Classic lands, or to Western Europe, or to the Western Hemisphere, the very science would appear to have arisen from the devotional feelings and tendencies of man. It is not the wealth and creative genius that were lavished on the temples built to the honour of the fabled Deities, the objects of Greek and Roman worship. Apart from all this, the art is peculiarly associated with our own faith, and the history and progress of our holy religion. I have already referred to the introduction of the style, strangely, though it is to be feared irremediably, termed Gothic—a name associated with barbaric ignorance and violence, and no way descriptive

of a style of art superior to the age in which it arose, and which exhibits the finest specimens of ingenuity, skill, and solemn and imposing grandeur. I do not mean to enter now into its merits and peculiarities. It matters little to my present purpose whether it was invented in Europe or not—whether it was original or borrowed from the East. It was new at least in the European world, and the sole peculiarity of it, to which I now allude, is that it was introduced first into the Christian Church—that it is peculiarly suited to sacred edifices—and that, from its introduction till now, amid all the improvements and modifications it has undergone, to them it has been all but exclusively confined. Hence it has been well termed "Christian Architecture." Its history, then, is inseparably associated with the history and practice of religion; and though we must never forget that the object of our worship "dwells not in temples made with hands," it is thereby invested with a peculiar and hallowed interest. I need not say that a series of fine specimens of architecture in this style are to be found in England, not only in her Cathedral and Collegiate cities, but in every nook and corner of the land. Nowhere else, indeed, is the style of this school, especially pointed architecture, more perfect. Nay, even in our own bleak and rugged Northern land, is to be found existing, in a greater or less degree of preservation, many an "holy and beautiful house," rendered precious by a thousand interesting accociations—gems attesting the purity of taste of days gone by, and the willingness to sacrifice wealth in the cause of religion, and which, by the elegance and majesty of their structure, rebuke the parsimonious spirit of the present cold and calculating age, in which men, though they dwell themselves in "houses of cedar," are content that the services of God's worship should be conducted in "tents and tabernacles," without one attribute of beauty or grandeur to assist in begetting reverence or heightening devotion. To these interesting monuments,

several of them in the best style of the art, some attention has already been directed, and the study of them is certainly very engrossing. Let us hope that the establishment of this Institute may lead to further researches, which, while they afford to those who make them rational occupation and amusement, may more fully develop the peculiar beauties of the style to which they belong, and tend to restore a taste which has been too long in a state of languishment and decay.

It may, perhaps, be expected that I should say something of the history and principles of Architecture, but of these subjects, the one is too wide for the limits I have necessarily assigned to myself, and the other it would be presumptuous in me, in such a presence, to discuss. Suffice it to say that, though the art is of early origin, its history is not one of regularly progressive advancement. Generally speaking, it has followed the course of civilization, flowing and ebbing along with it. One peculiarity, however, attaching to the science, I must not omit to notice. Of all the orders which have been admitted as distinct, the Greek and Roman are in every view the chief, and these may be said to have been brought to perfection by the illustrious nations whose names they bear. They belong to schools which have given law to the Western world,—they form a regular gradation,—their proportions are defined,—the parts of each are admirably adapted to its peculiar and distinctive character,—and they commend themselves to reason and the fitness of things. They are not held to admit of improvement, and all attempt at innovation is forbidden. The standard of taste, if there be a fixed and unalterable standard, is not so much applied to them as corrected by them. It is not, however, to be inferred from this, that, even in regard to these orders, the science is one in which, in every sense, finality has been obtained. It is not easy to limit the exercise of human ingenuity, and a wide field remains, sufficiently inviting to genius, and wor-

thy of being occupied by it. The combinations and adaptations that may be made are endless, and though the established proportions of what properly constitutes the orders must not be altered, it must not be forgotten how much of the beauty of ancient classic buildings is derived from circumstances that admit of infinite variety—such as the ornaments that embellish them, the style of their execution, the purposes for which they were intended, the situations they occupy, and the scenes they were meant to adorn.

As to the progress and state of Architecture in Scotland, I have already said that there exist here various ancient productions of the art indicating great skill and taste, but they consist chiefly of ecclesiastical edifices, and few, probably, if any of them, were the work of native artists. Attention to the art in modern times is of recent origin; and though I cannot speak but with respect of the spirit that has at length been awakened, and of the talents and successful efforts of those among us professionally devoted to the art, I fully concur with the originators of the Institute in the conviction they express, that the art "has not attained that position in the estimation of the people to which it is entitled." The remark, I believe, will apply to other parts of the country, and to other countries of Europe. Indeed, it seems to be too much forgotten how very far the modern world is behind the ancient as respects the principles of taste, and those productions of art which form the best and highest criterion of what is properly termed civilization. In regard to these we are but children as compared with various refined nations of antiquity. Look at their works in every department of human genius! The study of the classic authors of Greece and Rome—those master spirits—is universally prescribed as the best mode of disciplining our minds, unfolding our powers, forming our taste, and training us to correct thought, as well as the proper and elegant expression of it. The specimens

of their sculpture that have been preserved stand unrivalled; and from their monuments of architecture, in like manner, we are content to learn the first principles of taste and skilful adaptation. They embody principles that are imperishable, and from them are deduced laws whose authority is everywhere recognised. The present, indeed, though in many respects a wonderful—an industrious and plodding—is a dull and unimaginative, and withal, perhaps, rather a conceited generation. We certainly far excel the ancients in some of the appliances of external comfort, and in many of the material enjoyments of life, and our knowledge of natural science, and our discoveries, have been carried to an extent most creditable to modern effort, and of which the ancients could not even form a conception. But we should never forget that a knowledge of taste and art is an essential mark of high mental effort and cultivation, and that if we would study these with success, we must, with all our pride and self-sufficiency, be content to sit at the feet of ancient masters. Our progress, as yet, has been nothing, as compared with that made—I do not say by Greece and Rome—but even by some nations that have almost passed away from remembrance. Witness the few remains that are extant of the Etrurian people, who were swallowed up by the ruthless Roman power at an early period of its history, while their character as a conquering nation was as yet unmitigated by a love or appreciation of art.

It is matter, however, of congratulation that, with the progress of civilization, refinement, and luxury, there has recently arisen a greater attention to those arts, peculiarly dignified with the name of "fine;" and though I cannot concur in the over-sanguine and utopian anticipations of those who fancy that the last efforts of international war are over, there may be room for the chastened hope and sober belief that the gross contentions of physical force, that

so much retarded, though they could not altogether prevent, the progress of modern European civilization, are to be less frequent—that the ties of brotherhood between man and man, irrespective of language and of race, are to be more generally acknowledged, and a rivalry commenced in all that truly contributes to the convenience and comfort—to the happiness and improvement—to the adornment and dignity of man.

In the increased attention now paid to art, Scotland has not lagged behind. The march was long of being commenced, but its progress has been rapid and creditable, and there is ground for hope that the arts may find a permanent shelter even in our ungenial clime. The love of art may be affected by some, but even this betokens the general prevalence of the real affection. The productions of some of our artists are highly appreciated in the Southern Metropolis. Engravings of the finest gems of art and fac-similes of ancient sculpture, are in universal circulation. Articles of household furniture, and the most common household utensils—the very pitchers in which our water is drawn—are moulded from ancient models, in forms that delight the eye, and with a regard to taste and utility unknown to our fathers; and through the silent, and, it may be, unheeded operation of such causes, the public taste is being improved—greater stability as well as delicacy is being imparted to it, and the right appreciation of art is being promoted. Public countenance, too, has been given to our efforts. An Academy of art has been established, and a new Palace for the exhibition of its productions is about to be built at the national cost.

It is in these circumstances that this Institute has been projected and established. It limits its attention to one of the arts as opening up itself a wide field for study and exertion, but it acknowledges the bond that unites them all, and desires to promote the encouragement of all. Its head quarters are, as I think appropriately, fixed in this city.

Laying aside the vain pretensions that have led some to designate it the "Modern Athens," we yet flatter ourselves that we have among us not a few men of taste and learning, and that we can prefer some claims to high moral culture and generally diffused intelligence. If our city cannot boast of such temples and palaces as adorn some others, we have notwithstanding public buildings of beauty and fair proportions, and our domestic architecture is both elegant and convenient; the finest materials for building are to be found in our neighbourhood; the arts are cultivated here by associated bodies; the city is striking and romantic in point of situation, and has still, in some small measure, the characteristics of a Metropolis; and it possesses already not a few more than creditable specimens of the art, and a body of artists ready and able, when the means shall be afforded, to add to the number. Nor would I omit referring to many respectable members of the profession who have joined the Institute, and on whose efforts we place much reliance, belonging to the Metropolis of the West—that great mart of commerce, and chosen seat of manufacturing industry, which embraces within its limits a famed University, and has grown up under the shadow of an ancient Cathedral, with its unrivalled crypt, which the lapse of seven long centuries has left entire.

I need not enter on the particular mode in which the Society is to be worked, and its objects carried out. These are matters of detail. To ensure success, the united efforts of all, according to their ability, vigorously and zealously applied, will be necessary. Our chief reliance must, no doubt, be placed on the efforts of the professional members—the Fellows of the Institute. It is a delicate thing to refer to the mutual jealousies that exist among any class of men. They are to be found, however, in all professions. I blush to say that they are not unknown in my own. They result from opposing interests acting on human frailty; and I trust I shall not be

thought to abuse the opportunity now afforded me, if I express my hope and trust—I will add my firm belief and assured confidence—that the Fellows will remember that they are brought here, not as to a field of jealousy and angry contention, but to a scene of united and social effort—where all are to regard themselves as devoted to a noble art, and everything is to be eschewed that would degrade their science to the level of a trade—where lofty aspirations are to be cherished, and manly and honourable rivalry alone is to prevail—a rivalry worthy of educated and enlightened men. We who are the ordinary members of the Society, I fear, can promise little in aid of their exertions. I can say for myself, and many others too, that we have come hither to learn, not to teach, but I hope we may be found willing learners. I trust we shall prove in some measure a connecting link between the Fellows and the general public, and that the instruction we receive may be made subservient to the interests of our instructors, by multiplying the number of those who can observe accurately and judge correctly, and leading to a higher appreciation of their art, as well as a more liberal requital of their meritorious efforts.

I beg to apologise for having detained you so long; and, not venturing to expect your approbation of this address, I yet humbly solicit at least your indulgence to its prolixity as well as many imperfections.

EDINBURGH, 28*th* *November* 1850.

Transactions of the Architectural Institute of Scotland
Session 1850-51.

No. II.

ON THE METHOD BY WHICH THE MEMBERS GENERALLY MAY PRACTICALLY FOLLOW OUT THE ARCHITECTURAL PURPOSES OF THE INSTITUTE.

BY

The Very Rev. E. B. RAMSAY, F.R.S.E.

Mr President,

As this is but the second meeting of the Architectural Institute of Scotland, we may fairly, I think, once more deal with matter which is elementary and preparatory. My friend Dr Grant opened the first meeting with an Introductory Address, which was listened to with the deepest interest and attention. He delivered in eloquent terms an exposition of the great importance of Architecture, considered in its bearing upon the history of nations, and as shewing the relations of different countries and different races to each other; and following out these remarks so well proposed, we must now go on further organizing the practical working of our new Association, and must now begin its business in earnest.

I am sure, Sir, that no one present will accuse me of affectation, or suppose me guilty of mock humility when I apolo-

gize for taking up so much of the time this evening, before the commencement of the more regular series of papers. I now feel that it is wrong, and that I am in a false position. But I can only crave, which I do most earnestly, the indulgence of the meeting for an error which may at any rate shew some zeal and earnestness in the cause. Better times are coming, and abler expositors are to follow. My present object is to take a rapid survey of what this Association may effect—what results it ought to produce in practice—and what may be expected from all those who are enrolled intelligent Members of an Architectural Association. The present paper will no doubt seem desultory, and familiar and sketchy enough ; but the Institute need not be afraid—there will be plenty of dry enough papers by and bye. Scientific papers must have details too minute to admit of flowers of oratory, and description too precise for flights of fancy.

I think there are many objects connected with Architectural taste and science which we may expect to see realized in the progress of this Institution. The first is, that a good deal of attention will be directed towards the subject generally, and many persons will be induced to examine the principles of the art, and desire to know something of the rules by which a bad and untasteful building is to be distinguished from one that is a good and correct one. In this way, without making every Member an Architect, it may make him desirous, when he is engaged in building, to be more anxious that it shall be done well ; and for this end, to secure the advice and assistance of a competent Architect. The general standard of taste will be raised to a higher pitch. When Architectural errors are to be committed, remonstrances at least will be opposed to their accomplishment.

A second object we might look for, as a result of the formation of an Architectural Institute, is the formation

of an Architectural Library. This would be an important acquisition on many grounds. Architecture is an art associated with Literature and History. It is an art addressed to the eye: it has its rules and principles, its details and canons, which must be learned from the best authorities, and which must be studied in the best examples. We cannot expect to visit all buildings personally; many of us have seen but few. Descriptions of buildings can give only vague and indefinite notions. Memory even can only be expected to retain a general impression of their features, and can command but little of their details. A good Architectural Library would go far to put the best buildings, both as to their effect and as to the most minute details, at the student's command. He may compare and ponder, and fix the forms of distant buildings in his memory. It cannot be expected that, under ordinary circumstances, private individuals should possess many books of this kind. They are expensive, cumbrous, and many of them scarce. Few persons, even of those who have the means, are sufficiently interested in the subject to collect them; but it is desirable that books should be accessible to those who are at all turning their attention to the matter. There are but two ways in which such a library can be collected—by purchase and by donations. I hope we may by and bye have funds at command for this object; and I feel assured that, when we have a suitable building or suitable apartments for the reception of a library, Members would be disposed to send in contributions as gifts, and thus a consulting library of the best architectural works might soon be gathered together. In fact, we may say that each donor would be benefited; because, if I place the architectural books in my possession in such a collection, and others do the same by theirs, we have all of us the advantage of the common result.

A third object to be attained by the Society, or at least by the architectural taste and interest which it will raise up, may, I think, fairly be expected; and that is, to stay the hand of destruction often stretched out against some precious remains of ecclesiastical or castellated Architecture. In a spirit of cupidity, of wanton love of destruction, or of thoughtless ignorance, many such remains have been lost for ever. Nay, we might hope, in process of time, as some of the English societies have done, to be able to raise funds for purchasing, preserving, or even restoring such interesting remains.

Another important part of the active operations of this Association will consist in the reading of papers or memoirs in connection with the science of Architecture. Much of the spirit and interest of the Institution will depend upon these productions, and in process of time a Committee will be called upon to make a selection for publication in the transactions. The contributions will partake of the same mixed character as the Institute. We may look for papers of a *purely technical* character. An Architect engaged in a great work has in his experience made some valuable practical observations—has devised some mode of shortening the amount of labour, or of arriving at some given results. Whilst engaged with these, and whilst the calculations or estimates are fresh in his memory, he notes them for his own satisfaction and the benefit of others. They are preserved in these transactions, and become useful and valuable additions to the profession. But the field for papers is a very wide one. The subject abounds with objects of deep interest, which may fall into the hands of Members, professional or not professional—the illustration of distant fields of architectural observation by travellers, bringing home accounts of Egyptian, Indian, Syrian edifices—the comparison of foreign national buildings with cotemporary ones at home. In Germany, for instance, their Gothic churches

have the *flamboyant tracery* which ours have not. What are its distinctive characters? A curious comparison would be Scottish Gothic with Gothic in the same period of England;—I think there are differences. How often are architectural ruins and remains to be illustrated by history, antiquities, and local traditions. The Scottish castellated style, and old street style, have yet to be well explained and compared with English and Continental castles and streets. Every Scottish ruin—every old church—might furnish a paper in connexion with its Architecture. I invite the Members to supply an historical and architectural account of two most interesting objects near to Edinburgh:—the first is the curious old Norman church at Dalmeny, with a circular apse; and the second is St Margaret's Well at Restalrig. The latter few people have seen—many have never heard of it; and yet the late Mr Rickman told me it was the Gothic gem of Scotland. The all-conquering railway has, I believe, gone over it, but not destroyed it. The iron has not entered St Margaret's time-hallowed precincts, but overhead disturbs their quiet by the hourly rattling of trains and shrieking of engines.

It is needless to enter upon the general question of Associations formed for the purpose of promoting the advancement of arts, antiquities, or science. The question, notwithstanding a little pleasantry at the expense of the enthusiastic cultivators of any pursuit, has been practically decided in their favour, and the volumes of their transactions, and other publications, are convincing proofs of interesting, useful, and successful results attained under their influence. But a question regarding the constitution and composition of such bodies may be referred to here for a moment, as it affects the constitution of our own. I mean the question whether they should be formed exclusively of persons skilled in the object to be promoted, and engaged practically in its pursuit, or whether they should

be open to any who apply for admission, on the general supposition that they have an interest in the subject, or have some knowledge of it, or are desirous of gaining information. The Roxburgh Club was strictly confined to bibliomaniacs and black-letter students, or at least to collectors. Every member was supposed to be a sort of Dr Dryasdust. Not so in all similar institutions. Now, the London Architectural Institute differs in this respect from our own. It is composed entirely of professional Architects. The Edinburgh Council have, I think, wisely laid theirs open to all applicants, and for this obvious reason: the intention is to extend and ramify the knowledge and love of Architecture throughout the land. Not merely to improve the skill, and mature the judgment of Architects themselves, but to direct the tastes and stimulate the exertions of others who have a most important office to perform in the erection of buildings. I need scarcely say that I refer to those who have to *pay for them.* We must always bear in mind that in the erection of any edifice, public or private, there must ever be these two parties; and if there be not some taste and zeal for good work on the part of *employers*, no skill or taste in Architects themselves will avail to put their ideas into shape. They may have the most beautiful and correct designs of buildings in their portfolios, but the power to call them into life is wanting. If the late Mr Donaldson had not bequeathed a princely fortune to build and endow an hospital—if Mr Donaldson's trustees had not acted with so much liberality and confidence towards the distinguished Architect whom they employed, we should not have seen raised in our own time, and in the vicinity of our own capital, a building of such magnificence—such grandeur of outline—such rich and exquisite detail. To a liberal and enlightened expenditure we owe that happy adaptation of Grecian Doric in the High School. That lovely Corinthian

portico and pediment in George Street, on which the eye is never weary to rest—that fine tower and spire crowning the Castle Hill—and that most successful Gothic restoration at Leith. We should add that splendid piece of masonry the Scott Monument. But to take more ordinary cases, and cases where influence is exercised upon the erection of buildings on a scale of far less extent and costliness than the noble works I have referred to: One cannot but perceive and mourn over the total absence of taste and architectural knowledge which has existed in quarters necessarily giving the character to cotemporaneous erections. We feel that for many such blunders and deficiencies the Institute has come too late. The evil is done, for Architecture is permanent and enduring in its deformities, no less than in its beauties. The architectural efforts in this kingdom were for a long series of years deplorable specimens of design, and signal proofs of want of familiarity with right principles. A great improvement has of late years been manifest in the erection of buildings of a public and a private character, for civil and ecclesiastical purposes. In this country, we have many errors to be ashamed of; but we have been redeeming our character, and it is quite evident that in the capital of Scotland at least architectural taste and architectural knowledge are gaining a free scope and free exercise. All our recent edifices are proofs of this improvement. Now, it is at such a juncture that the present Institute comes forward most appropriately, and at a time when there is good prospect of some influence. It would extend a knowledge for which there is evidently a growing desire—it would foster taste already sprung up—it would direct zeal awakening in favour of correct as well as for magnificent architectural productions—and it is earnestly hoped that the zeal and the knowledge which will be spread under *its* influence may operate beneficially on

our Architects by giving increased facility for their communicating with each other, as well as on those by whose means our Architects are to be set to work; that increased facilities and more liberal provision be made for executing their designs, and, at any rate, that less injurious interference be opposed to their experience, taste, and skill. This would be the great advantage of knowledge of architectural principles amongst non-professional men: They would feel themselves guardians of the public taste and public works in matters where they had a voice: They would encourage the good, and set themselves against the very bad, merely as matter of taste. In 1792, when the new buildings were erected in the castle of Edinburgh for barracks, we cannot believe that one person amongst those concerned in the erection could have had the slightest notion of what taste or fitness in Architecture meant. Whilst the building was going on, a comparatively small sum would have imparted *something* like the character of the old buildings, on which the new edifice was to be intruded. Expense was not then considered so much an object in public buildings. The *taste* and *feeling* were wanting, and no friendly voice was raised—no hand was stretched forth to save us from the disgrace of such a deformity. On the first night of our meeting we were honoured by the presence of the Lord Provost, who is a member of the Institute. Had there been in those days an Architectural Institute of which our Chief Magistrate had been a member, we cannot believe that such an atrocious act would have been perpetrated. He would have made, or have caused others to make, an effectual remonstrance. Then, again, turn to another painful subject —painful, I mean, in an architectural point of view—the building of Scottish parish churches. Alas! how different from the lovely ecclesiastical edifices of the English Establish-

ment! For a number of years it really seemed as if the great object of Heritors on such occasions was to solve this problem, viz., how, at the lowest possible expenditure, they could produce the greatest possible amount of architectural deformity. I remember once having the honour of conversing with Sir Walter Scott on the subject of the decline of Gothic Architecture in Scotland, and on the change that had taken place in ecclesiastical buildings since the ruin of that beautiful abbey which was close at hand, and which had furnished subjects of so much interest in his own immortal works. He lamented the utter want of architectural taste in the parish churches round Abbotsford: he concluded with this whimsical comparison—'A Scotch kirk in this country, with its short 'spire,' he said, 'always looks to me like a little hump-'backed man with a walking-stick thrust down his back.'

I am quite aware of the difference between the needful training and the knowledge of a professional Architect, and of one who has other pursuits in life, or of one who cultivates a taste for Architecture as he may do for any other of the Fine Arts. I am aware that it is a dangerous thing for the amateur to intrude into the mysteries of the practical work of building. It is an ominous and doubtful expression concerning a gentleman's house when you hear it said, 'Oh, I am 'my own Architect.' The story is well known of one gentleman who, when he laid *his own* plans before the builder by whom they were to be executed, was met by this appalling observation, 'But, Sir, you have forgotten the stair-case!' This is not, however, always the case with amateur or non-professional Architects. One of the finest mansion-houses in England has been built entirely under the direction of the proprietor, at Tracy Park, in Gloucestershire. It is a purely Gothic edifice, and is formed by a combination of parts all taken from some fine specimen of ancient English Architec-

ture, whether found in churches, cathedrals, colleges, mansions, or remains of monastic buildings,—the stair-case, the hall, the dining-room, the gallery, the windows, and so on, answering to each. The idea is not very promising; but I believe the skill and taste with which the parts are combined have, in the eyes of the most critical judges, fully vindicated the design. We know also that an Earl of Burlington was an eminent practical Architect, and built several houses and public edifices of Palladian Architecture, much admired by those who are partial to that style of building. Still, I think the offices of amateur and professional Architect are essentially distinct. The amateur may take a more enlarged and diffusive view of art than the professor, who may be too partial to his own particular walk; and hence it is remarkable that the leading historians of art, whether of Sculpture, Painting, or Architecture, have been written *not* by artists. We have in this class very distinguished names, as those of Winkelman, Cicognara, Lanzi, Milizia, Agincourt, and in Architecture specially a very distinguished name, as historian of the art, the late Thomas Hope.* From men of this class *out* of the profession we may fairly look for many substantial benefits, and for essential support, in promoting the objects for which this Institution has been set on foot. A man who had forgotten the stair-case in a plan of his own house might nevertheless have a fine taste in Architecture, and possess sufficient knowledge of its general principles to protect and direct the *public* taste.† The committee of five who decided upon the contending claims of above eighty designs sent in for the new Houses of Parliament were all unprofessional, and I am not aware

* Hope's History of Architecture is a work by all means to be studied.

† A principle illustrated by Samuel Johnson, when he told Boswell, 'Why, 'yes, Sir, a man may complain of a bad chair or table who never made either in 'his life. It is not his trade to make tables.'

that the public impression is *against* their decision. It is with the formation of taste and the improvement of knowledge for Members of the Association generally that we are now concerned, and not with the education of professional students. Men are not taught the technical knowledge requisite for their success as Architects by such institutions as the present. Still, as already observed, an Architectural Institute may be to them of great use, as a channel for mutually communicating their ideas, and encouraging them to note the results of their experience; at the sametime, they ought to lead the unskilled to gain such an insight into the principles of Architecture as may enable *them* to appreciate the finest productions of the art. This would be especially useful to them in hearing skilful papers, or in visiting fine works at home or abroad. No one can fully enjoy travelling without such knowledge: and whether the observer contemplates the remains of Grecian art as exhibited in the matchless Parthenon, or in specimens still existing on the shores of Ionia, Sicily, Attica, and the Peloponnesus,—whether he visits the seats of Roman building, the Colosseum, the Pantheon, the Aqueducts, or other works, which mark the greatness and the architectural skill of *ancient* Italian buildings,—whether in the streets of Rome, Vincenza, Genoa, Ancona, Turin, Florence, or other cities, he looks out for the works of more *modern* Italian art by Guilio Romano, Michael Angelo, Palladio, Sansovino, San Michaeli, Scammozzi,—whether he paces the dim aisles of the magnificent cathedrals of the middle ages,—the Colognes and Strasburgs of Germany—the Rheims', Beauvais', and Rouens of France—the Sevilles and Cordovas of Spain—the Salisburys, Yorks, and Lincolns of our own land,—he should be able to discriminate between the respective styles, as one style differs from another, and as each style differs within itself,—he should so far know what constitutes

the standard of excellence as to be able to say why this is pure and graceful, why something else is faulty, and wherein it differs from what is good.

Now, if it be not an unwarrantable trespass upon the time and patience of the meeting, I would humbly propose to take a rapid sketch of the ground over which every one so qualified to appreciate architectural excellence should have passed,—of the architectural principles with which every one should be acquainted, and with which every one may easily be acquainted. I address myself of course to those who have paid little attention to their ideas on this subject. I beg the forbearance of those who know well all that I may be able to say. I hope, however, that truths even the most elementary never can, if fairly and clearly stated, be altogether uninteresting and tiresome, even to the most skilful and experienced.

In this endeavour to sketch out the ground over which the amateur student in Architecture may be supposed to pass—the manner in which he should observe, as he goes along, and the objects he should keep before him, I need not now speak of Indian and Egyptian Buildings. They are deeply interesting subjects; but they are not only too difficult for a sketch, they lie also removed from our present purpose. The student then begins, I suppose, with Grecian Architecture. Whether it be derived at all from Egypt, or how far it arose from it, or copied it, is not now the question. It is a contested point. But we may take it as we find it; and the first step, I conceive, is to gain a thorough acquaintance with the details and effects—the spirit and the letter of classical Architecture—as developed in the three Greek orders, the Doric, the Ionic, and the Corinthian. To a certain extent this is easily attained; treatises abound. The articles in the Encyclopedia Metropolitana and Ency-

clopedia Britannica furnish very fair measures of information. The plates in the Encyclopedia Metropolitana are beautiful. The article is written by Mr Narnen of the Royal Military College.* The *terms* of art should be carefully studied, and well understood; but let it be remembered that it is not merely the power of knowing *terms* that the intelligent observer of classical models should possess, but also the power of appreciating their beauty—their fitness in their own position. It is not enough to talk of Architrave, Frieze, Cornice, Mutule, Modules, Propylæum, Prostylos, Cymatium, Pycnostylos, &c. &c. He must feel how they bear upon one another, and how they conjointly produce that effect which this style of Architecture, and this alone, is calculated to produce upon the mind. The effect of Grecian Architecture is not like effects in Gothic Architecture—vast, complex, bewildering, infinite: it is one pure and harmonious whole. You cannot change the proportions—you cannot vary the outline—you cannot combine one order with another—you cannot make a new order intermediate between those already existing. *There* stand the three orders in their inimitable beauty—monuments of Grecian art—monuments of the perfect and graceful conceptions of the Grecian mind. Like reading the finest works of Greek authors, a contemplation of Greek temples conveys the idea of a production in itself perfect—should convey the idea of unbroken symmetry. Nor is there a want of variety in such effects. Each order has its peculiar character, and is entire in itself. The Doric is severe; grandeur and majesty are its distinguishing attributes. The Ionic is graceful, elegant, and, at the same time, simple, and free from elaborate detail. The Corinthian is full of ornament, rich in detail, and yet how

* Mr Cockerell's drawings and measurements of the Parthenon and other buildings are invaluable.

simply beautiful in its effect—how commanding, we might say how *dignified* in its proportions. We can almost fancy an enthusiastic lover of Grecian Art *personifying* the three orders, and able to realize, through the outlines of the stone, presiding minds, and permeating intelligence. But I must not indulge in these abstractions. Should any one be disposed to study the moral sentiment and the mystical emotions that can be deduced from Architecture, let him ponder over one of the most extraordinary productions of our day—a work by a graduate of Oxford, entitled 'The Seven Lamps of Architecture.' On the question of beauty, as associated with Grecian Architecture, I need hardly remind the student of Lord Aberdeen's small but admirable treatise.

But we suppose the student has now gained a fair knowledge of the parts and details and proportions of the three orders of Grecian Architecture. He finds his next step is a modification of these orders in their character, and an increase in their number. The Romans *altered*—I do not know why we should say corrupted—Grecian Architecture. They added—why should we say they interpolated—two orders, the Tuscan and the Composite; and they brought the art to bear upon the additional uses which they found for it. Let it not be forgotten, that pure and lovely as was the Grecian Architecture, it was only applied to one object, the Temple. There was no habitable interior. The style was not used with them for domestic purposes at all. It is a mere exterior, so far as the spectator is concerned. The Greek sacred Architecture was internally a simple cell of narrow dimensions to contain a single statue. But the Romans required more. They had to build bridges, baths, aqueducts, palaces; and accordingly they enlarge the sphere of their architectural elements. The great power which they possessed in marble and stone was, that they could turn the arch—they had

the vaulted roof—they had the dome or cupola. Here, then, are new powers and new capacities for grand effect. Buildings gain height, and expand into great dimensions. The student examines that alteration of the severer features of Grecian Art, which renders it an adaptation for Roman purposes—new combinations of elements are to be considered—new embellishments—as for instance, the archivolts of the curvilineal part are to be ornamented. New resources are required for filling up the spaces of the extended fronts, and (in comparison of the severe Grecian colonnade and pediment) the elaborate and complex elevations of their buildings. Whilst going through the Roman style, the student observes its purity in the severer and earlier department immediately arising from the Hellenic. He then traces it on to a state of comparative corruption and debasement, and again marks its restoration in a magnificent and plastic form, under such minds as Guilio Romano, Michael Angelo, and Palladio—a form which was introduced and naturalized in this country, especially by Sir Christopher Wren and Inigo Jones.

But now the student is prepared for a new and a very different style of building—a style, on the history of which, and the origin of which, there has been controversy without end, and, I may add, a great deal of controversy without meaning. The name certainly is unfortunate, 'Gothic,'—for it has as little to do with Goths as it has with Egypt; and I fear the name was given in scorn as equivalent to *barbarous*—being borrowed from the Italian writers of the fifteenth century, who contemptuously applied the term to all works of art in the middle ages. From them Wren is the first English writer who uses it. Still the term is there, and we must be satisfied to retain it. A name is difficult to alter, and if we know what it exactly means, it answers the purpose. Nor does it appear to me that the names proposed would be altogether suitable;

for instance, 'Pointed' Architecture is not a correct term, for an essential part of it is circular: 'Ecclesiastical' is not, because it is not confined to ecclesiastical purposes, and many ecclesiastical edifices do not adopt it: 'Christian' is not, because in a great part of Christendom it is not used, and never was used. But to pass from the name to the thing. Out of the Roman Architecture there arose two styles or orders of building, used especially for church building—the Lombard and the Norman. Of the former I have little to say. It is the ordinary type of churches in Italy. It has many enthusiastic admirers, and none more liberal and intelligent than the Honourable Sydney Herbert, who, at his own cost, and at a great expense, has built a complete—a beautiful—I may add, a gorgeous church in this character at Wilton, near Salisbury. It is a fine edifice, rich and glowing with variety of colouring—agate, jasper, lapis lazuli, carving, gold stars, azure, and gilded vaults. It is impossible not to admire it as a mere artistic production, but as a *church* edifice my associations do not go along with it. Of the Norman style we may simply say that at first it has the appearance of a debased and inferior Roman. The pillars are enormous, sometimes little more than a diameter in height; the arches ponderous and unadorned; the vaulting or groining mere massive ribs and cross-springers; the windows without tracery, and the capitals of the piers, instead of the fine delicate Ionic volutes, or rich Corinthian acanths, are grotesque imitations, or sometimes cut plain off on four sides, making a square top, as if the Architect, in despair, had determined to adventure nothing; the door-ways, even the earliest, are sometimes very rich, the whole carried round with profusion of ornament. The principal of these ornaments, and one very different from any in the previous styles, is the chevron or zigzag. I know it is said to have been traced to some ornament in the Church of St John, built by Con-

stantine outside the Roman walls. Still, how it came, and how it was used in such profusion, seems a mystery. These Norman doors abound with decorations of chevron, cable, billet, nail-head, beak-head, rose ornament, &c., as may be seen in great preservation at Durham, Malmesbury, Ifley, Northampton, &c. It was worked to great nicety and perfection in Normandy, as at Caen, in several churches, and especially St Stephens, where the true Norman style is executed with a rich and finished effect, of which we have no example in this country—not there confined to doors or portions, but extending entirely through the whole building, interior and exterior. This, I suspect, was carried on there whilst the English Architects were working at the more *pointed* forms of Church Architecture.

At this word Pointed Architecture springs up the great contest—What is the origin of pointed architecture? Where did it originate? Who first adopted it? It came from imitating trees in an avenue—it came from the intersection of arches at St Cross—it came from the East—it came from the pointed timbers of Noah's Ark. With all this, except as matter of curiosity and matter of history, the student has no concern. *He can trace the pointed architecture growing out of that which went before it.* Every step is so resolved back into some previous modification of Norman work; in fact, there exists a style of transition between the one and the other—between the Norman and the first pointed—called by some architectural writers semi-Norman. What more can be required? You see the circular arch taking a sharper sweep—you see the heavy piers clustering into four smaller, or becoming one smaller, with many shafts set round—you see the windows becoming narrow as the arch becomes sharp, so as to make the lancet; the capitals are reduced, and foliage set round the former blank sections of the Norman; the chevron is

raised forward, and brought to angular points, like a little pyramid, and, in fact, as I have said, the one style *passes* into the other, and even some time after it has been advanced (as at the north transept of York), retaining some circular character of the Norman from which it sprung. When we see the pointed style gradually and imperceptibly growing out of the previous Norman, we require no other origin. It stands out before us, and we discern the steps by which the successive workmen had brought it to perfection. Most satisfactory specimens of this transition are found at Canterbury and at Romsey, in Hants. Sir Christopher Wren and other respectable names are quoted for the Eastern origin of pointed architecture. But they gave the opinion without study, and without consideration. Britton, and other more practical writers, have proved that at Acre, Jerusalem, and other places, the specimens of pointed architecture referred to as being found in them at their capture had been built by Christians themselves—for Acre was not taken till 1290, and at that time, according to Gibbon, had 60,000 Christian inhabitants—and they have also proved that long after the Crusaders had returned, churches continued at home in the circular style. People forget that Norman work contains in itself abundantly the germs of a pointed style. It is found in some of the *oldest* Norman churches, the crypt of St Peter's, Northampton, and in places at Durham. Wherever there is groining over an oblong space, by means of ribs, and cross springers from corner to corner, the ribs *must* be pointed; they cannot be semicircular, or they would not reach high enough. This may be observed generally about Norman buildings. There is a perfect example at Jedburgh, in a kind of oblong side chapel entering from the garden of the manse. The clergyman shewed it to me with much politeness. The truth is, Gothic Architecture, like the Grecian, had the same origin—

the ever active intelligence of mind, and the eternal passions of the heart. It is the result of original power devoted to the attainment of excellence, receiving its *first* impulse and direction, possibly, but no more, from accident and circumstance.

In its first pointed form, as refined and matured in the reign of Richard I.—say up to the year 1190—we have the graceful and the perfect productions of Salisbury; transepts of York; parts of Beverley; Westminster Abbey; much of Lincoln; part of Wells; front of Peterborough; and many other exquisite examples in England. Of these, the only uniform building of the style is Salisbury, the erection of which extended from 1218, when the foundation stone was laid, to 1258, when the completion was celebrated. From east to west, with the exception of part of the spire, it is all the same. The effect is so light and so majestic—the unity of design and detail so happily preserved—that we would almost estimate a student's genuine taste for this style of Architecture by his admiration of this building. To accommodate what Quintillian declared of Cicero—'Ita propositum sit nobis exemplum 'ille se proficesse sciat, cui Sarum valde placebit.' After this, we follow the style into a more elaborate, more free, and more ornamental stage. After that, and out of that, arose a style peculiarly British—profuse in ornament—covered with minute pannelling—the new arch struck by a combination of four arches from four centres—and still more marked by the lines of tracery running through, from top to bottom of a window or pannel, expressed by Rickman's happy epithet, of 'perpendicular tracery.' The finest specimens of this style are St George's Chapel, Windsor; the Beauchamp Chapel, Warwick; the Lady Chapel, Peterborough; Henry VII.'s Chapel, Westminster; and, above all, King's College Chapel, Cambridge. It is a style inferior in taste and effect to the two former; but still it has many striking

points, when well executed. One part peculiar to itself is very beautiful, the *fan* tracery, of which we find the germ in the cloisters of Gloucester—the perfection in King's College Chapel. Here the student then exercises himself in close examination of a most interesting and delightful branch of Architecture. Unlike the Grecian and the Roman orders, its styles are not separate; but between the full formation of each there is a transition from the last gradually leading to it: and hence we have the terms 'early' or 'late.' 'Early or late early English'—'early or 'late decorated'—'early or late perpendicular.' The curious part of the history is, that it was a *constantly* progressive style. *The Architect never went back upon a former style.* When adding to an older building, he did it in the style of his own day. A curious example of this occurs at York. The Architects, when building the nave, which is decorated, had to put in a pier to replace one in the transept, which is severe early English. But instead of putting in one of the older piers for uniformity, they put in their own style. In all the series, from the commencement of Norman building at the Conquest to the end of the reign of Henry VIII., the student has to mark these successive changes—I do not say improvements. The style had its rise—its meridian—its decline—its fall. In grace and simplicity the perfection of the style was attained through the reigns of Richard I., John, Henry III., and Edward I. In rich and chaste adornment, perhaps through Edward II. and III. The fall is remarkable. The style from this time changed, but was still good, through Richard II., Henry IV., V., and VI., Edward IV. and V. Deterioration then became apparent. It commenced with the minute and over-strained embellishment of the perpendicular workmen of Henry VII. It soon passed into imbecility. Let the student examine for this

purpose the composition and detail of Bath Abbey, the last of the English line. There he will see their faults begun—their meagre mouldings—stiff pannelling—hard, angular, ungraceful combinations—and towards the east end (apparently the last portion finished), absolutely great *square* windows, without arches at all. And then fast came on the age of a most tasteless and grotesque Architecture, just as the light of science and religion were dawning on the world. The darker ages had hovered over the most beauteous and solemn and majestic buildings the world ever saw. But after that style had died out, for many years a perfect infatuation seemed to pervade the mind of English Architects on the subject. The fine old churches and cathedrals went through a dreadful ordeal. The most horrid mutilations of the finest portions of work were made to let in monuments of the most barbarous character. Additions were made of Palladian work actually upon the Gothic, and when the friendly hand of *restoration* was held forth, the matter, as at Salisbury, was even still worse. But one need not be much surprised at the aberration of inferior minds, when you find the error entertained and fostered by no less a name than Sir Christopher Wren. He could not discern any beauty in Gothic Architecture. Nay, may we not tremble for the stability of national taste when we find such a man talking of our cathedrals as 'mountains of stone'—'vast and gigantic 'buildings not worthy the name of Architecture.' He talked of them as 'congestions of heavy, dark, melancholy, Moorish 'piles, without any just proportion, use, or beauty.' In accordance with these sentiments he added the two west towers to Westminster Abbey, which in detail are perfect failures—unworthy of Wren—unworthy of the building. But a better day for ecclesiastical building was to come. The subject was carefully and methodically examined.

Half the clergymen in England got a Rickman, and talked of early English, decorated, and perpendicular churches. The better zeal for erecting additional places of worship for the increased and destitute population having arisen at the same time, churches sprung up by hundreds. Architects studied the practical development of the pure architectural spirit of the middle ages. The improved art of carving in stone and wood—of painting in glass—of making encaustic tiles—of casting bells and brass ornaments,—all seemed to grow up together. And what has been the consequence? A restoration of the style in its strictest features. Beautiful churches are multiplied through the land, combining in endless variety the examples of the 12th, 13th, and 14th centuries. The student and admirer of Gothic Architecture meets with them now at every turn. In some instances they are found in a very striking and complete form, as in the restoration, after two fires, at York, in the parish church at Leeds, at Camberwell, and Hackney. Amongst the Roman Catholics, superb specimens have been produced, as in St George's, Westminster, Cheadle, and other places. I am happy to be able to refer to such good Scottish work in this style as the complete and beautiful restoration of the parish church, South Leith. A new campanile or bell-tower has been built alongside of it. The clerestory windows, long built up, have been opened, filled with tracery and painted glass. We might also refer to many beautiful Episcopal Chapels built in Scotland within these few years,—as at Stirling, Dalkeith, Jedburgh, Dunblane, &c.

With regard to a study of this style—Gothic Architecture there can be no difficulty as to directions and authorities. All Britton's works, Pugins', The Glossary of Architecture, Whewell's German Churches, are storehouses of information. But as the grammar of Gothic Architecture I

have no hesitation in especially recommending for attentive study the fifth edition of Rickman. It is published at Oxford, and has been edited by a skilful hand, who has expanded portions which were not in former editions fully developed. Rickman was the first Architect who clearly discriminated the peculiarities and the styles of Gothic Architecture. He seized upon the prominent points of distinction. He brought the question of *dates* to bear upon the varieties of ecclesiastical Architecture in England through the middle ages, and he examined all the details with the utmost minuteness, marking the progressive changes in relation to the period. I do not say that Rickman is infallible, but I am convinced that he is quite right in the classification he has adopted. In his work will be found excellent remarks upon the difference in character and principle between Grecian Architecture and Gothic, an ingenious discrimination from Norman work of the Saxon portions which still linger amongst the old English churches ; and he points how we are to mark the successive styles, by observing the changes effected, not only in general character and in those parts which at once catch the eye, as windows, piers, &c., but in the more curious and minute changes, as in *mouldings*, for example, which require careful attention. Nothing is more important to the student of Gothic Architecture than an accurate and systematic study of the changes in mouldings. In proof of Rickman's general correctness as to the dates I may mention this fact. Britton, who does not favour Rickman particularly, and who rejects his nomenclature of early English decorated and perpendicular, has, in the fifth volume of his Architectural Antiquities, drawn up, with great labour and care, a table of churches, cathedrals, and portions of ecclesiastical edifices, marking the date corresponding—the actual time of their erection. So far as I have been able to

examine and compare, I have found that, according to Rickman's arrangement, each portion mentioned by Britton would, according to his system, belong to the actual date which has been deduced from historical records. Rickman had been preparing a publication before his death, which, if completed, would have been a great boon in an architectural point of view. He had begun to collect an immense number of Gothic details—in fact all that could be found, and all arranged according to chronology. He was to have had all the designs of window tracery, of corbels, crockets, finials, mouldings, piers, clerestories, towers, spires, west fronts, east ends, pannels, &c., in order that the peculiar characteristics and the changes of each of these details might be traced in reference to their dates.

I knew Mr Rickman, and admired the simplicity and enthusiasm of his character. He united what one would have thought the rather incongruous natures of a Quaker and an enthusiast in Gothic Architecture. He worshipped God in the meeting house—he was a dweller in Cathedrals. No man better appreciated the peculiarities and niceties of Gothic Architecture. Perhaps his buildings do not equal his reputation as an *expositor* of his art. His best, I believe, is the new part of St John's College, Cambridge. The Quaker character might have appeared more prominent had he lived longer, and been required to fit up churches with all the mediæval restorations which have lately taken men's fancies. I recollect an anecdote of a High Church Clergyman at Coventry asking him for a Gothic pattern for grand *candlesticks* to be placed on the altar. Rickman hesitated, and hinted that candlesticks, being sometimes considered of a somewhat superstitious observance, he would give him a design for two gaslights from the wall—one on *each side* of the table.

These are considerations which I humbly suggest are

what should be kept in view by all who are desirous of promoting the advancement of a right Architectural spirit in the minds of those who have to build, and of those who have to judge of building. It is of the last importance that correct *principles* should be adopted, and that all criticism for approval or rejection should be grounded on those correct principles. There are many modes for men to gain a reputation for skill in art amongst their cotemporaries. There are many ways by which men can force themselves forward as critics on the works of others, and lay down dogmatic rules. There are many expedients by which men with little knowledge can obtain great influence in the decisions upon questions which are to be disposed of by committees and governors and trustees. But there is only one mode by which men can duly qualify themselves for the office of judge or umpire on works of art, and that is by a diligent and intelligent study of those principles which have the deliberate sanction of all taste and genius, and which have, at the sametime, outlived the prejudice of party, and the caprice of fashion—by gaining accurate knowledge of the finest productions of the art, either from books or ocular inspection—by knowing the rules which guided those who produced them, and by careful examination of their relation to the various circumstances of their position; and, perhaps, to give these attainments their due effect and full impression, nothing is more valuable to be added, than a humble estimate of the capacities brought to bear upon the questions under discussion, and a modest diffidence in the disposal of them.

I am perfectly certain that the cause of taste decaying among us, both with the nation and its Architects, is their losing sight of pure models; their corrupting not the general forms and composition of the different styles so much as their rudiments and details. Wren, notwithstanding his

heresy on Gothic Architecture, was great in his own department, and his greatness, and his production of great works, consisted in the adoption only of what was good. He had great variety of effects, but it was invention of new combinations, not of new detail. This, too, was the process by which Palladio restored the Roman Architecture. When Brunelleschi and others had engrafted upon it fancies and conceits of their own, Palladio recalled them to the simple and correct beauty of the original type.

But it is time, Sir, for these remarks to close. Let me only add then, that there should ever be joined with our promotion of fine art a high moral and religious feeling. There is a certain right tone of mind which should be always associated with the productions of the Painter, the Sculptor, and the Architect. God, in his goodness, has connected with sensations of the useful, sensations also of the sublime and beautiful. For this we should ever feel grateful, as for a dispensation of providence calculated to promote our happiness and enjoyment. Painting and Sculpture are not essential to the existence and physical comforts of mankind, nor are the proportions and ornaments of Architecture. But He who has joined beauty of form and colour with productions of vegetable, mineral, and animal creation, has also, in goodness, joined the graceful, the grand, and beautiful with the dwellings of mankind; with the buildings erected for public uses, whether of amusement or of charity, and with the temples raised for His worship and His honour. This is a boon, and a boon which we ought to receive with grateful consideration; it adds to the stock of human enjoyment in a pure and elevated form. The erection of noble buildings, and the preservation of noble buildings, are a mark and proof of a prosperous and civilized condition of a people,—their destruction, dilapidation, and debasement, indicate a decline of wealth and power; they shew

the presence and the ravages of such discordant elements as internal strife, war, and tumults. One object of this Institution I hope will be to preserve in the minds of all its members a fuller sense of obligation to protect and improve our national Architecture, so that we may not fear the perpetration of deformities in the finest materials and on the most splendid sites for building in the world. Many grand edifices of once great nations are now crumbling in ruins. May we hope that for us the times are past, both for barbarous building, and for violent destruction of edifices.

Lastly, May we hope that by opportunities for friendly meeting and free conference the day for fierce contention and angry jealousies on the subject of art will be gone for ever. Amongst the many causes which arise in this world for human irritation, this we trust will be excluded for the future. We could almost wish works of genius annihilated, when we find that amongst men of genius they give occasion for rancour and detraction. Different minds will admire different sorts of excellence. Architects themselves have their partialities and favourite styles. Let each follow his own bent, and cultivate his own department, especially having his eye on all. A tyrannical and exclusive taste in any art is inconsistent with the liberal spirit of the times. What may we not expect? The British Engineers and Architects of the present day stand as high as the Engineers and Architects of any age in genius and industry,—in taste, in mechanical resource, and in scientific attainment. The enterprize of the age has called forth works of British Engineers unsurpassed—unequalled in skill, in vastness, and in triumph over natural difficulties. Give the Architect the same facilities, and he will produce effects in his own department equally striking. The spirit of the age is in favour of a right school for its buildings in every style and department. We

have the revival in the public taste, and we are proud of the effects of that revival in our own beautiful city, where Scottish Architects have produced such splendid examples in different styles of building. We feel assured that these want only means and encouragement to make the reign of VICTORIA as memorable for architectural *works*, as it is already distinguished for the high bearing, the liberal attainments, and the generous enthusiasm of its ARCHITECTS.

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No. III.

WHAT WILL IT COST?

BY

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The question, What will it cost, was selected as the title of this paper in order briefly to indicate the scope of the following remarks, which are entirely of a practical nature,—perhaps too much so indeed to be of general interest to the Members of this Institute. I shall therefore endeavour to treat the subject with all due brevity.

What will it cost? A weighty question this, which ought to be gravely put, in regard to every object that can excite the ambition or vanity of the human mind. A wide field of inquiry is thus opened up doubtless, but I shall follow it only so far as applicable to architectural design, in regard to which all must admit its importance. Indeed it is in accordance with the daily experience of the Architect that when a new work is proposed to be confided to his care, the first question generally put is—'What will it cost?'

Now, admitting to the fullest extent the propriety of ascertaining with all possible accuracy the ultimate cost of any work before commencing operations, it seems deserving of

inquiry what the effect upon art is of thus giving to such considerations a place of the first importance.

In every architectural work—no matter of what extent—whether a cottage or a palace—the first and all-important question is, What do the circumstances of the case in hand require? Determine this question, and having done so, then follows, in its natural course, that as to cost. Even in cases where, of necessity, the question as to cost must be strictly kept in view, mere cheapness ought never, for a permanent building, to be the sole aim. There are considerations of higher interest, which, in no circumstances, ought to be overlooked—not even in the erection of the humblest cottage—not to speak of public buildings. For it must ever be kept in mind that the works of the Architect differ from those of all other artists, inasmuch as they bulk largely on the eye of the public, and cannot be hid. Unlike the productions of the Poet or the Painter, they cannot be laid aside when their brief hour of popularity has passed away. On the contrary, they are prominent and enduring structures, generally of such magnitude as to add new features to the aspect of the country. The architectural monuments of successive ages, therefore, serve as landmarks, indicating to future historians the progressive stages of advancing refinement. In this view, Architecture becomes the exponent of the civilization and habits of a people: it is read and known of all men, and ever obtrudes its emphatic testimony on the most transient passenger. Its records have been preserved when every other record of the people who owned it have perished in the abyss of remote antiquity. And even where Tradition herself had become silent, the works of the Architect in the infancy of the world have, by the perseverance of a Layard, been disclosed to view. The gorgeous halls and stately palaces of ancient Nineveh proclaim, as with the thrilling voice of one

raised from the dead, the vast resources of that mighty empire, and the pomp and glory of her potentates, who thus seem restored back again to the world after ages of oblivion. Such is the high position which Architecture assumes—such the responsible duties which the Architect is called on to perform. He becomes the historian of his country's civilization, and his works are written as with an iron pen on tables of stone. He can, therefore, no more perform those duties lightly, or with a sinister motive, than can the Military Engineer, to whom are entrusted the outworks for the defence of his country: he cannot, in order to please the taste of his employer, do what he, after mature deliberation, believes to be a violation of good taste, any more than can the Physician alter his prescription to please the palate of his patient.

If such be a true representation of the views which ought to guide the Architect in the performance of his duties, it will not be difficult to determine the position in the consideration of any contemplated work which ought to be assigned to the question—What will it cost?

Thus to preface all our inquiries, and to make the question of cost paramount to every other consideration, is to lay an instant arrest on design. The Architect thus fettered is precluded from all sympathy with the good and the true—the only source of the beautiful. The imagination must be schooled down to the views of the utilitarian, who values everything by a money standard; and thus images of nothing but what is cheap present themselves—ever meagre and starved in their forms. All aspirations after those forms of beauty which art can supply are quenched. The imagination thus enthralled refuses her office, and the advancement of art becomes impossible; its very existence is altogether perilled. The Architect thus trammelled must be content to descend from the high platform of his profession, and occupy

the more humble position of the handicraftsman. The effect of this system, so injurious to the mind of the designer, is alike fatal to the result of his labours. A building reared under such circumstances for ever afterwards betrays its sordid origin in the meanness of its features, and the leanness of its forms, which, in spite of all future efforts, can rarely be effaced. Nothing short of the direst urgency should induce the Architect to give way to the system—nothing short of physical necessity can excuse it. Begun with the one object of economy alone before the mind, the meagre starved design, in the course of being developed, seldom comes up to the expectation of its proprietor ; and during its progress is not unfrequently made to undergo a variety of transmutations, in the vain hope of rendering its ungainly aspect somewhat more attractive. The result in most such cases is, that the cost in the end is greater than if a proper system had been at first adopted. The unhappy Architect loses his credit, and the disappointed proprietor loses his money, without attaining his object. It were easy to illustrate these remarks, by reference to examples around us, and these not everyday works, but such as are of considerable pretension to architectural effect, occupying a prominent position, and bulking largely on the public eye.

But without referring to recent works, the Parish Churches of the last century may be safely quoted as illustrating the miserable result of giving pre-eminence to the question of cost. What huge monstrosities do we see scattered all over the country. How often do we find some miserable fabric, stamped in its every feature with sordid parsimony marring one of nature's loveliest landscapes, in which she has scattered her richest stores in boundless profusion. And how sadly do these contrast with the Parish Churches of England of the 14th and 15th centuries, or with those of the same period

still existing in our own country, so beautiful even though in ruins, and adding fresh charms to the fairest scenes. Those fine fragments of bygone ages have done more to revive the dark superstitions of their times than the world care to admit. But why should good taste, or a true and noble Architecture, be confined to the unreformed creed of the middle ages. Let Heritors and Proprietors abandon the miserable system of starved economy, and follow the more generous system of bygone times, already so auspiciously revived in various quarters. The Banking Establishments of our cities, and other public institutions, have shewn in their recent architectural works a fine example of wise and judicious liberality, which, it is to be hoped, will not be lost sight of by other public bodies throughout the country, so that the question, What will it cost? will no longer be allowed to lord it over every other consideration.

Are considerations of expense, then, to be entirely overlooked or set aside? By no means. No man beginneth to build a tower without first counting the cost. But surely he must previously, and first of all, endeavour to form a clear idea of what the tower ought to be, and of what the circumstances require at his hands.

The peculiarities of the site, or of the neighbourhood, will all be considered by the judicious Architect. He will endeavour to work out his design in accordance with these, having a truthful regard to the circumstances of the case, and an enlightened view to the ultimate good of the whole. Having thus endeavoured to form a clear idea of the extent and character of the proposed work, he will, while attempting to realize it, and give it form, employ all the artistic skill at his command. In this way the mind is left unfettered, and free to choose from amidst all the forms of beauty which fancy can disclose. And it is only by following such a course that

Architecture can be entitled to take its place, and rank first amongst the Fine Arts. Painting and Sculpture will then become her handmaidens, ever in attendance to adorn and exalt her.

It is at this stage of the proceeding that the question of expense comes up in its natural order—a question deserving ample inquiry, and an honest answer; and in no department of his art are the skill and qualifications of the Architect more severely put to the test. The pecuniary interests of his employer are confided to his care: he looks to him on the one hand for protection against the undue demands of the contractor, and on the other, against an undue increase of additional works arising from his own neglect or oversight. The Architect, then, requires not only a thorough knowledge of the qualities of the various departments of work, but of their value, and of the modes of measurement, in order to be able to judge of the rates of charge. Though called on to look to the interests of his employer, he is equally required to see that justice be done to the contractor. And when the accounts come to be submitted to his award, he is to act with the uprightness and integrity of a judge, and is bound to see justice done at whatever sacrifice of feeling or of self-interest—a task this at once difficult and delicate, requiring a thorough knowledge of the value of the varied and multitudinous items connected with the building art, which can only be acquired by laborious and incessant perseverance.

The want of proper skill in these matters, or perhaps of proper attention to them, is the cause of that fatal error which so frequently occurs, of estimating the probable expense of a contemplated work at a sum far below what it is possible to execute it for. Such a system is injurious to the best interests of true art. It engenders suspicion and dis-

trust, and its inevitable result is to make in future the question of cost a paramount object. And while in the first instance it may only affect the pockets of the employer, it is sure in the end to tell against the Architect. Complaints against this system are not new. It is curious and instructive to find they are greatly more ancient than the days of old Vitruvius himself, as the following extract from the writings of that most judicious author amply testify.

'In the magnificent and spacious city of Ephesus,' says that author, 'an ancient law was made by the ancestors of 'the inhabitants, hard, indeed, in its nature, but nevertheless 'equitable. When an Architect was entrusted with the exe-'cution of a public work, an estimate thereof being lodged 'in the hands of the magistrate, his property was held as 'security until the work was finished. If, when finished, 'the expense did not exceed the estimate, he was compli-'mented with decrees and honours. So when the excess did 'not amount to more than a fourth part of the original esti-'mate, no punishment was inflicted. But when more than 'one-fourth of the estimate was exceeded, he was required 'to pay the excess out of his own pocket. Would to God 'that such a law existed among the Roman people, not only 'in respect of their public, but also of their private buildings, 'for then the unskilful could not commit their depredations 'with impunity, and those who were the most skilful in the 'intricacies of the art would follow the profession. Proprie-'tors would not be led into an extravagant expenditure, so 'as to cause their ruin. Architects themselves, from the 'dread of punishment, would be more careful in their cal-'culations, and the proprietor would complete his building 'for that sum, or a little more, which he could afford to ex-'pend. Those who can conveniently afford to expend a 'given sum on any work, with the pleasing expectation of

'seeing it completed, would cheerfully add one-fourth more; 'but when they find themselves burdened with the addition 'of a half, or even more than half the expense originally 'contemplated, losing their spirits, and sacrificing what has 'already been laid out, they incline to desist from its com-'pletion.'

But, on the other hand, it not unfrequently happens that complaints of this kind are most unjustly preferred against the Architect, who is often in this respect more sinned against than sinning. How often are his designs cut down and denuded of their fair proportions in order to effect some trifling saving in expense? and after being contracted for in their modified form, how frequently does it occur that, during the progress of the work, one item is ordered after another by the proprietor, without due regard to the effect which these will have upon what has already been done? and the result is, that the whole becomes an incongruous piece of patch-work; and there remains the mortifying reflection that in consequence of the contracts having been interfered with, the 'bills of extra work,' added to the estimate, greatly exceed the sum that would have served to complete the original well-matured design. To the Architect imbued with a true feeling for his art, nothing can be more tantalizing than such a result, for which he is in no way responsible, and for which he is often most unjustly blamed. It is always unwise, and seldom very safe, to interfere with plans after the work has been contracted for and fairly commenced. None but those in the practice of design can conceive how entirely one part hangs on another, and how dangerous it is to interfere with any architectural work after it is in progress. While only on paper, it may be modified or reconstructed as often as circumstances require, as, in this case, the effect of any alteration is at once seen and provided for by a readjustment of the other portions until the whole is brought

into harmony. But when once contracted for, the design ought to be inviolable. Alterations in these circumstances are always costly, and the Architect would do well to set his face resolutely against them. This may at times be a delicate task, requiring tact and judgment, but it is a duty which no Architect who values his reputation should shrink from performing.

Where economy requires to be very closely studied, the old Vitruvian rule of avoiding materials which are not easily procured and prepared on the spot, is still the most effective, and of most general application. The building materials of the neighbourhood, besides being the cheapest, generally harmonize better with the landscape than those which are foreign to the soil. England's brick mansions of the olden time, however beautiful amidst their 'tall ancestral trees,' would ill accord with the stern clime and rugged scenery of the north. In ordinary cases, therefore, where mere general effect is all that can be aimed at, the building materials of the district, being not only less costly, but more artistic and effective, are to be preferred.

All ornamentation, where economy is an object, should be dispensed with; for unless fully carried out, it but serves to betray the poverty which it is meant to hide. Simplicity of outline, and a due proportion of the several forms add nothing to the cost; and where these are properly attended to, the result will generally prove satisfactory.

Admitting, then, to the fullest extent, the importance of the question, in its proper place, which forms the subject of this paper, I have endeavoured, on the one hand, to point out the very injurious effects to Architecture, as a branch of the Fine Arts, which follows from giving it the precedence of all our other inquiries. Its tendency is to degrade art, and to cover the country with monuments interesting to the Arch-

æologist only, as marking the money-loving spirit of their epoch, and the low state of art at the time.

On the other hand, I have endeavoured to point out the proper period at which the all-important question as to cost ought to be determined, and the no less injurious effects which a wrong solution of the problem has upon art, and the necessity there is of the Architect being thoroughly qualified to form correct estimates of the value of building materials and of labour, so that he may be able to adjust his design to the money proposed to be expended.

These remarks, it is true, do not directly bear on the principles of art or of Architecture, and they may in consequence appear to some to be of too humble a nature to form the subject of a paper for this Society. But if I have succeeded in conveying in any degree a just sense of the importance, in architectural design, of limiting to its proper place the question 'What will it cost,' and of giving it, in its own place, a full and honest answer, I shall feel that my labours, however humble, have not been altogether in vain.

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No. IV.

NOTES OF EARLY SCOTTISH ARCHITECTS.

BY

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Scarcely anything has been collected as to the early Architects of Scotland. Not much, perhaps, has been preserved; but no pious hand has been put forth to gather and arrange even the few and scanty memorials that survive.

Of the builders of our many cathedral and conventual churches, only one name has been handed down to us—that of Gilbert of Murray, who, towards the middle of the thirteenth century, reared the High Church of Caithness, at Dornoch.* He was a churchman—the bishop of the see whose cathedral he built. According to a tradition recorded two centuries ago, he caused even the glass of its windows to be fashioned upon the spot. 'All the glasse which served that 'church,' says Sir Robert Gordon, 'was made by St Gilbert 'his appointment, beside Sideray,'—now corrupted into Cyderhall,—'two miles be-west Dornoch.'† Not many facts, perhaps, are preserved, more instructive of the progress which

* Breviarium Aberdonense, Prop. SS., i. April.

† Genealogical History of the Earldom of Sutherland, p. 31.

the useful arts had achieved in Scotland during the thirteenth century than this, that the difficult manufacture of window glass should have been carried on upon the distant shores of Sutherland, amid fierce and hostile tribes, and at a moment, too, when the province was still languishing under the scourge of war and rebellion.*

The name of St Gilbert of Murray stands alone in our records as that of the Architect of a cathedral. But we have the names, at a much later period, of one or two persons to whom were entrusted the repairing or completing of our great ecclesiastical structures. They seem, for the most part, to have been Frenchmen. About the end of the fifteenth century, John Murdo or Murvo, a Parisian by birth, had the charge of the cathedrals of Glasgow and St Andrews, of the conventual churches of Paisley and Melrose, and of the abbeys in Nithsdale and Galloway.† Not many years later, one who seems to have been his countryman, Thomas French, built one of the transepts of the cathedral church of St Machar at Aberdeen, and the fine bridge of seven ribbed arches which still spans the Dee about two miles to the south of that city.‡

The first secular buildings of any architectural character which arose in the north, were probably the design of the unknown artists to whom we owe our monasteries and cathedrals. It is recorded of St Gilbert of Murray that besides his cathedral of Dornoch he built many royal castles.§ Ancient tradition names Kildrummy, in Mar, as one of them.‖ It is in the best style of our older fortresses—its chief characteristic being round towers of elegant shape and good

* Two Ancient Records of the Bishoprie of Caithness. Edinburgh, 1847.

† Morton's Monastic Annals of Teviotdale.

‡ Inscription on St Machar's Cathedral at Aberdeen.

§ Breviarium Aberdonense.

‖ Genealogical History of the Earldom of Sutherland, p. 32.

masonry, like what may be seen in the more ancient portions of Caerlaveroc on the Solway, Bothwell on the Clyde, and Dirleton in East Lothian.

A little intelligent research among our extant rolls and records would, I doubt not, serve to recover at least the names of several of the builders of our greater palaces and castles,—perhaps also of an occasional church,—from the middle of the fourteenth to the close of the seventeenth century. I have noted a few. In the years 1368 and 1369, Sir William of Disschington, Knight, steward of the King's house, and sheriff of Fife, was 'master of work' of the church of St Monans, in Fife,—a not unpleasing example of the Decorated or Middle-Pointed style.* In the year 1451, Alexander of Crichton, a kinsman of the subtle chiefs who built the stately chateau of Crichton,† was master of work of the Castle of Kildrummy. In the year 1434, Robert Gray, master of the mint, was master of work also of the Castle of Edinburgh, and of a Palace which was building at Leith.‡ In his charge of the buildings in the Castle he had probably succeeded Walter of Spot, who appears in that capacity in the year 1425.§ Alexander Gulde was master of work for the Castle of Stirling in the years 1429 and 1434.‖ In the year 1424, John of Livingston,** and in the year 1434, William Valandy,†† were masters of work of the bridge over the Tay at Perth. Robert of Livingston, perhaps a kinsman of the former, was master of work of the King's Palace at Linlithgow, in the years 1435 and 1437, Sir Robert of Weddale being conjoined with

* Compot. Camerar. Scot., vol. i, pp. 496, 524.

† Compot. Camerar. Scot., vol. iii, p. 530.

‡ Compot. Camerar. Scot., vol. iii, pp. 187-9, 194, 241, 245-6.

§ Compot. Camerar. Scot., vol. iii, p. 154.

‖ Compot. Camerar. Scot., vol. iii, pp. 186, 219, 221.

** Compot. Camerar. Scot., vol. iii. p. 166.

†† Compot. Camerar. Scot., vol. iii, p. 264.

him in the office.* They were succeeded in the year 1449 by John Weir.† In the year 1459, Master John of Livingston, vicar of Inverugie, undertook the building of a bridge over the Dee at Aberdeen: he was to have for his fee £20 a-year for ten years.‡ This churchman may perhaps be identified with the person of the same name who was the architect of the bridge over the Tay in 1434. The name of Thomas of Cochrane, master of work to King James III., has a place in all our histories. The King, it is said, wished to raise him to the peerage; but the proud northern nobles, indignant that a mason, as they termed him, should be made an Earl, seized him and put him to an ignominious death at Lauder in the year 1482.

Under King James V., in the beginning of the following century, Sir James Hamilton of Fynnart was employed in building or repairing the Palaces of Falkland and Linlithgow, and the Castles of Edinburgh, Stirling, and Rothesay. His own towers of Craignethan served to attest a skill which proved fatal to its master. He was put to death in the year 1540 for the crime, real or imputed, of inventing certain engines—'an infernal machine' it would be called in our day—by which the King was to be shot from the tower of Linlithgow.§

The years which immediately followed the Reformation were not favourable to art; but it was the beginning of the next century that produced a style of domestic architecture which, thanks to the admirable work of Mr Billings, is now beginning to be rightly appreciated. The Castles of Fyvie, Craigston, Crathes, Craigievar, Castle Fraser, Midmar, are

* Compot. Camerar. Scot., vol. iii, pp. 324, 369, 370; 201, 202, 324.

† Compot. Camerar. Scot., vol. iii, p. 521.

‡ Extracts from the Burgh Records of Aberdeen, p. 22.

§ Act. Parl. Scot., vol. ii, p. 362.

edifices of which no country need be ashamed. Little or nothing as yet unfortunately has been ascertained of their builders. Fyvie—perhaps the noblest of them all—assumed its present shape under the care of Alexander Seton, Earl of Dunfermline, whose 'great skill in architecture' is especially commended by his contemporaries. To the taste of this accomplished nobleman also we owe many of the beauties of Pinkie House. Lord Dunfermline was not the only Scottish Peer of the seventeenth century who cultivated a knowledge of the principles of Architecture, or applied them to practice. For the imposing pile of Glammis, as we now see it, we are indebted to the taste of Patrick, third Earl of Kinghorn and first Earl of Strathmore, who died in the year 1695, at the age of fifty-two. His own account of his building enterprise still exists in MS. at Glammis. It was in the year 1670 that he took up his abode at that ancient seat of his forefathers. 'For the first two or three years,' he says, 'of my time at this 'place, the most part of my work was to remove the great and 'old timber which I found here, and I think I got about '£1000 Scots for it. I have not left of the little planting 'which was here a standing tree but one, which was one of the '*dool* trees where they played of old upon the green at the burn 'side.' The Earl proceeds to describe very circumstantially his making a scheme or draught of his projected improvements at the castle, and takes blame to himself for not consulting 'any who in this age were known and repute to be 'the best judges and contrivers.' He dwells upon the cumbrous old buildings which surrounded the castle, and the labour it cost him to remove them. He swept remorselessly away, not only stables, hay barns, and ruined buildings of all descriptions, but what he describes as a spacious old hall and 'the chamber of deas,' both of which had been long unroofed. He filled up the great inner ditch, and two other

great ditches, all of which appear to have surrounded the castle. He takes great credit to himself for the success of his undertaking, and has left us the most minute account of what he had done, and was projecting, as well as his advice for the ultimate laying out of the park and gardens.

In the works of which I have hitherto spoken, Gothic or Mediæval styles either reigned uncontrolled or greatly predominated. Classic features would seem to have owed their first introduction to foreigners—natives of Italy—who brought with them the taste for Roman Architecture, newly revived beyond the Alps. It is perhaps in the collegiate Chapel of Roslin—built about the middle of the fifteenth century—that the earliest traces of *renaissance* are to be found in Scotland. Though but very imperfectly developed—only peeping, as it were, through a Gothic mask—there can be no doubt of their presence. They are sufficiently accounted for by what is handed down to us of the history of the building, for which the Earl of Orkney is said to have brought an Architect from Italy. His name has not been preserved, nor do we know the name of his countryman, who, half a century afterwards, was employed in the works of King James IV. The account-books of the Lord High Treasurer of Scotland* in the year 1512 and 1513 merely inform us that 'the 'Italian mason' had a salary of seven pounds a month. To this artist, probably, we may ascribe certain peculiarities of style in Holyrood and Stirling.

When architectural taste began to revive, after the tempest and wars of the Reformation, classic types gradually advanced in prominence and frequent recurrence. In the ceilings of the Gallo-Scotican castles of Craigievar and Balcarres we have the warriors of Troy mingling their effigies with those of the judges of Israel and the elder kings of the Scots. This was

* MS. in her Majesty's General Register House at Edinburgh.

early in the seventeenth century. The middle of that age saw the building of Heriot's Hospital, and it needs but a glance at that magnificent pile to recognise the large admixture of classic detail with the spirit of the Middle Age. We may now, perhaps, without much hesitation, venture to vindicate the chief merit of this structure for a Scottish Architect, William Aytoune, whose portrait, inscribed 'Measter Meason 'to Heriot's Vorke,'* long hung in the governors' room of the Hospital. He would appear to have been of a family which was connected with a noble architect of whom I have already spoken,—Alexander Seton, Earl of Dunfermline. Besides his share in Heriot's Hospital—in the charge of which he succeeded William Wallace, to whom the building of Wintoun House has been ascribed—William Aytoune is known to have been the Architect of Innes House in Moray, a building of no great merit, yet showing some trace of architectural skill. The Architect's fee 'for drawing the form of the house 'on paper' was £26 : 13 : 4.

The name of another Scottish Architect of the seventeenth century has been preserved, in connection with what is perhaps the finest market-cross in Scotland, that of the city of Aberdeen, built in the year 1686 by John Montgomery of Old Rayne, in the same county.†

The name of yet one other little known Architect of the same age claims to be remembered, from the place which it has found in the '*Vitruvius Britannicus*.'‡ The second volume of that work contains an elevation of Melville House,

* It is engraved in Constable's Memoir of George Heriot, p. 34.

† Kennedy's Annals of Aberdeen, vol. i, p. 408. An older historian of this city records the name of another northern Architect, George Thomson, who, about the year 1634, rebuilt the imperial crown which surmounts the tower of King's College at Aberdeen.—Orem's History of Old Aberdeen, p. 173, edit. 1791. But see Spalding's Memorialls of the Troubles, p. 257, edit. 1850.

‡ Vol. ii, Plate 50.

in Fife, the seat of the Earl of Leven and Melville, with a ground-plan of the principal storey. The letterpress informs us that the building was designed 'by the most experienced 'Architect of that kingdom (Scotland), Mr James Smith, anno '1692.' Perhaps some member of the Institute may be able to furnish some farther information as to the works of this artist.

The first volume of the work which I have named has two plates of Drumlanrig Castle, which the letterpress (published in 1715) tells us, 'was greatly adorned by the two preceding 'Dukes, with noble gardens, and many other expensive decora-'tions.' The name of the architect unhappily is not recorded.

I have reserved the last place in my imperfect catalogue for Sir William Bruce of Kinross. With him—though his name has not, so far as I am aware, found its way into any of our Scottish biographical collections—the dominion of classic Architecture may be held to have been finally established in the north. He may be regarded too as standing between the ancient and modern Architects of Scotland—between those obscure or forgotten builders, some of whose names I have brought before you to-night, and their successors, the Gibbs', the Adams', and the Mylnes', whose labours are commemorated in the most common works on architectural history.

Like so many of those of whom I have had occasion to speak, Sir William Bruce was a man of some rank. He was the hereditary sheriff of the small shire of Kinross, and before the year 1685, was advanced to the dignity of Knight Baronet. He married a lady of the name of Hacket, by whom he had a son, his successor, Sir John Bruce; and a daughter, Anne, who carried his estate and lineage into the knightly family of Hope of Craighall and Pinkie.

Sir William appears as architect to King Charles II.—his Majesty's surveyor, as his office was termed—as early as

the year 1671; and he survived the beginning of the eighteenth century by about fifteen years. The mansion-house which he built for himself at Kinross, about the year 1685, was long regarded as one of the boasts of Scottish Architecture. Other edifices of his design are engraved in Slezer's Theatrum Scotiæ. But perhaps his most admired work was Hopetoun House—now built over by the later design of Adams—the seat of the Earl of Hopetoun in West-Lothian. Two plates of it are to be found in the Vitruvius Britannicus.* It is stated to have been begun in the year 1698, and the building occupied four years. An earlier work of Sir William Bruce was the Palace of Holyrood. His plans for this structure were submitted to the King in the year 1671, and were diligently revised by his Majesty, in a paper which is still preserved, but is not now altogether intelligible, the plan to which it makes constant reference having unfortunately fallen aside.† We can see, however, that had the King's wishes prevailed, the effect of the Palace would have been seriously injured. Charles wished the curtain between the great towers in the front to be raised to the same height as the buildings on the other sides of the quadrangle, and to be roofed like them. His Majesty, to use his own words, 'liked not the 'covering of all that betwixt the two great towers, with plat-'form at the second storey, but would have it heightened to a 'third storey, as all the inner court is, and slated with slate, 'as the rest of the court is to be; by which means a whole 'storey will be gained, only with the expense of heightening of 'an ashlar wall.' Sir William Bruce had designed the interior of the quadrangle to be highly decorated, but his design was not carried out. 'His Majesty thinks the way proposed for

* Vol. ii, Plates 75, 76, 77.

† I have learned since this was written, that the plan is now in the hands of a gentleman who, I am happy to say, contemplates its publication.

'the inner court would be very noble, but he will not go to 'that charge; and therefore his pleasure is that it be plain 'ashlar, as the front is, with table divisions for storeys; and 'if that be judged too great an expense, his Majesty will 'rest satisfied that it be good handsome rough work, with 'handsome mouldings for the windows, and table divisions 'for the storeys.'

Holyrood appears to have been completed before the year 1679, when it became the residence of the Duke of York, afterwards King James VII. One memorial of that prince's taste still survives in 'the Duke's Walk,' one of the noblest promenades to be found in the neighbourhood of any city. Another instance of the judgment and foresight of the Duke and his advisers in the Fine Arts, rests upon somewhat less certain authority. He is said to have contemplated the erection of a city upon the site on which the New Town of Edinburgh arose nearly a century afterwards; and so far had the matter gone, that his Architect, Sir William Bruce, is reported to have planned a bridge for spanning the valley of the North Loch. So at least was affirmed by a tradition which was committed to record about seventy years ago. Alexander Kincaid, whose history of Edinburgh was printed in the year 1787, while giving all credit to Provost Drummond for the building of the New Town, adds, that he is informed on good authority that even this gentleman was not the original projector of such a grand plan. 'The Duke of York,' he continues, 'afterwards the unfortunate James VII., was the 'person who, in a visit to Edinburgh, had the penetration to 'discover at one view the improvements that might be made, 'and pointed out to the magistrates the extension of the city 'both on the south and the north sides. No person, however, 'from that time seems to have formed any design of putting 'in practice those improvements which the monarch thought

'possible, until Provost Drummond, by an indefatigable ex-
'ertion of his interest with government, obtained parliamen-
'tary sanction for the improvement of the city, and by an
'equally unwearied exertion of the influence which his su-
'perior merit deservedly gave him over the people, prevailed
'on them to concur in the proper methods of rendering
'their city an ornament to the country and an honour to
'themselves.' Kincaid, in a note, adds some further details of interest. 'There are some people yet in life,' he says, 'who can attest the fact that Provost Drummond declared 'to them, when the foundation of the North Bridge was 'laid, that we only now began what the Duke of York '(afterwards James VII.) proposed. And I am farther in-
'formed,' says Kincaid, 'that a plan of a bridge across the
'North Loch was drawn by Sir William Bruce of Kinross,
'and is supposed to be lying in the Exchequer here.' The writer of the letterpress of 'Scotland Delineated,' refers to a letter dated in 1693 for proof 'that a design was then
'formed to erect a bridge over the North Lōch, build streets
'on the other side, and inclose the ground with a wall.'*

John, Earl of Mar—the early patron of Gibbs—during the exile into which he was driven by his share in the insurrection of 1715, prepared a plan for the extension of Edinburgh, as well to the south as to the north. His project embraced 'a large bridge of three arches over the grounds
'betwixt the North Loch and Physic Garden, from the High
'Street at Halkerston's Wynd to the Multursey Hill.'†

* Scotland Delineated, part vii., p. 117.

† Statistical Account of Scotland, vol. viii., pp. 648, 649.

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No. V.

ON ORNAMENTAL ART,

AS APPLICABLE TO THE INTERNAL DECORATION OF HOUSES.

BY

JAMES BALLANTINE, Esq.

The people of England have always been remarkable for their domestic habits and feelings, and hence the air of comfort and neatness which is so generally found pervading even the humblest dwellings of this highly favoured land. In the domestic proprieties arising from this love of home, we have the most gratifying evidence of the moral greatness of the nation. When a man takes a pride and pleasure in decorating his dwelling-house, we may be assured that he is a man of right feeling, for his solicitude in this respect is a proof of his love and affection for those his dwelling contains, and this renders him one of those by whom the moral power of the nation is upheld—who form, as it were, the thews and sinews of her independence.

While such feelings as those just alluded to are so widely diffused amongst the masses, they also obtain to a very large extent amongst the higher classes of the com-

munity; princely fortunes being often expended in erecting, decorating, and furnishing mansions, which, in extent and grandeur, rival the most celebrated structures of antiquity. It might be thought that in a country where love of home and its comforts is so general, that species of domestic decoration would be most prized which was most homely in its character, and best calculated to awaken homely associations. As yet, however, few of our household decorations have been in unison with such feelings. The chief efforts of decorative art have been confined to mere reproductions of certain conventional modes of embellishment formerly practised in other countries, without regard to their applicability, and without due consideration for the difference of circumstance and place. There is something preposterous in attempting to adapt the decorations of the ancient public edifices of Greece and Rome to the modern private dwellings of England, between which association presents not one connecting link. A style of domestic decoration in harmony with the English character has yet to be introduced. A correct standard of national taste has yet to be formed. At present our household decorations are little better than collections of shreds and patches; and hence the numerous incongruities which present themselves in the furniture and decorations of many of our most splendid mansions. To such an extent does this prevail, that sometimes we shall find the walls of an apartment adorned with Gothic paper-hangings, the ceiling and cornice ornamented with Grecian foliage, while the furniture is of the light and fanciful style of Louis Quatorze, an arrangement than which none could possibly be more preposterous. In other instances we find the floor covered with a carpet loaded with gorgeous colour, and the sofas, chairs, and curtains rejoicing in the most brilliant hues, while walls, woodwork, and ceiling, are kept per-

fectly colourless, as if the architectural detail and proportions of the room were of no importance.

This state of matters is unworthy of the nineteenth century, and calls for immediate amendment. Philosophical research is ever and anon throwing additional light on the paths of science. Man, by the ingenuity of his contrivances, is yearly increasing the production of the necessaries and luxuries of life; and, amid these manifestations of mental progression, there seems no reason why the decorative arts should remain stationary, still less why they should retrograde. On the contrary, there is good ground to believe that these arts may, under the controul of a well regulated taste, arrive at a state of high perfection in our own time and in our own country. The various recent exhibitions in Westminster Hall proved that British painters were qualified to excel in the high department of historical design, while the subjects illustrated were in many instances identified with the most interesting portions of British history. Seeing, then, that this has been the result in high art, may not a similar result be reasonably expected in the minor department of ornamental design. If British history affords subject for historical representations equally well calculated to excite the feelings with any event recorded in the histories of Greece or Rome, have we not also native plants and flowers equal in beauty to the lotus of the Egyptians, or the acanthus of the Greeks, and equally well calculated to form the basis of a British school of ornamental design as these were to form those of Egypt and Greece.

The failure of the repeated attempts which have been made to introduce into our internal decorations various kinds of foreign ornament shews that such designs were not in harmony with English feeling. Some half century ago, an Italian of the name of Michael (Angelo) Pergolesi was employed to decorate the mansions of some of the nobles of England, and

the monstrosities which he perpetrated were published at the express desire of his patrons, for the purpose, as they said, of improving the public taste. The public, however, was not to be imposed upon. He of the high sounding name descended quickly into oblivion, and his works followed him. Even Watteau himself, by far the most original of grotesque ornament designers, has become somewhat stale—his fantastic improbabilities having lost much of the favour which they once enjoyed. The Louis Quatorze style of ornament, although at one time almost universally adopted in house decoration, and carried into every article of furniture, was alien to the genius and the feelings of the people of England, and was accordingly dismissed with as little ceremony as its predecessors. There was a feeling of comfort and substantiality associated with the wainscoated halls, tapestried chambers, and massive oaken furniture of old England, which could not be imparted by the gimcrack furniture, dainty silks, and *petit* colouring of these styles, and hence, in part at least, the very remarkable revolution which has taken place in house decorations, a revolution which affords good ground to expect a change of a higher and more elevated character.

There are some present old enough, perhaps, to remember the time when the wood-work and ceilings of rooms were generally painted pure white, while the walls were either green, yellow, or some other staring colour. The abolition of this miserable style of embellishment arose from the introduction of the imitation of woods and marbles—an art which our house-painters have brought almost to perfection. It is an art, moreover, peculiar to England, and one in which no other country has ever approached us.

A certain high authority has condemned the deception which is produced in painting by imitation, alleging that no attempt should ever be made to make an object appear what

it is not. Such doctrine carries absurdity on the face of it; and if pushed to the limits of its application, would extinguish all the imitative arts, including that of painting in all its branches—from the humble imitation of mahogany or maple on the panel of a door, to the landscapes of Claude, and the portraits of Titian. If a common fir door is made to resemble some rare and beautiful wood, and that so closely, that without the most minute inspection you cannot tell that it is not what it appears to be, is there not something gained? A homely material, destitute of all beauty, has, at comparatively small cost, been converted into an object of admiration. A great point in economics, I say, has been attained: cheapness has been combined with elegance and beauty. Deception! why, nature itself is full of deceptions. The concavity of Heaven is a deception; the rainbow, with all its magnificent colouring, is deception; and a deception, too, are the golden glories of the western sky. Why, then, should the harmless deceptions of painting be singled out for castigation?

The art of imitating woods and marbles has been long known in this country. We have evidence of its having been practised in Lancashire nearly 250 years ago, and we know not how long before. One of the rooms in Houghton Tower was painted in imitation of marble in the time of James Sixth of Scotland and First of England, and was called, on account of its being so painted, the Marble Room. I have had no opportunity of seeing this early specimen of the art, and know not whether it be yet in existence. I therefore cannot say what degree of excellence in this department had then been attained. With regard to the imitation of wood in former times, however, I may mention that I have heard an old house-painter, and a very old man, state that once, when employed to paint an old country church, he had

discovered on some of the wooden lining an imitation of walnut tree, apparently of very ancient date, and of such beautiful workmanship that the old man said it almost broke his heart to be compelled to lay it over with whiting.

I have already remarked that the success in recent times of our painters in their imitations of woods and marbles led to a more refined system of colouring our apartments. They began to see the propriety of using tints instead of full charged colours, and of bringing the walls and ceilings to assimilate more with the beautiful, clear, neutral tints of the imitation woods and marbles. That this system of neutralization has been carried to a ridiculous extent cannot be denied. Indeed it was at one time carried so far as to threaten the expulsion of positive colours from house-painting altogether. This feeble and timorous style, however, is being supplanted by more bold and vigorous arrangements of colour. The tints are now used, as grey is used in picture-painting, to give brilliancy and point to the more decided colours which are taking their proper place in our decorations ; and the art of house-painting is now beginning to be as well understood as the painting of pictures, the one having its rules as well as the other. The delightful tints and half-tints, which are produced in endless variety by the admixture of different proportions of the primary colours tempered by the representations of light and shade, can be so distributed and arranged as to produce the most soothing effects upon the eye ; and by the skilful use of graduated tints of colour, it is easy to conceive how the softness and retirement of distance may be introduced into the decorations of an apartment. There can be no doubt that in these respects we greatly excel the ancients, who, although remarkable for their knowledge of proportionate combinations of form and colour, in so far as balance and contrast were concerned, seem not to have been

aware of the delightful effects which may be produced by the admixture of colours.

In decorating a house, the house painter ought to proceed on precisely the same principles with the picture painter, namely, with a due appreciation of, and regard for, the effects of each detail, in reference to the whole. He ought to introduce no jarring elements—no scraps and patches, destitute of connexion or association ; and, of all things, let him beware of inconsistency and indecision. Every apartment ought to be treated in a manner corresponding with its purpose and use, and each portion in harmonic relation to another. In whatever way the walls are decorated, the ceiling should be ornamented correspondingly; but as the latter is farthest removed from the light, and as we naturally expect light to emanate from the space overhead, the colours used on it should be clearer and lighter than those on the walls. The floor, instead of being loaded with colour, as it is now in too many instances, by means of gaudy carpeting, ought to be kept of a low and deep tone,—the floor, in fact, should appear a subdued and modified reflexion of the ceiling. Treated in this way, the apartment would be kept entire, and any effect produced that might be wished. The ceiling is the only portion of a room of which we have at all times an uninterrupted view ; and hence the necessity of having it decorated in a careful and pleasing manner. When seated, we naturally raise our eyes upwards ; and when an agreeable combination of colour meets our view, the effect is peculiarly delightful. In some situations, ceilings of a delicate tint of sky blue, studded with golden stars, have a fine effect ; and in some instances I have known the deception so complete, that when the apartment was artificially lighted, you could scarcely believe but that the canopy of heaven was your only covering. Stars, however, like everything else, ought to be kept in their

place: when stuck on the walls of a room they are not where they ought to be, and the effect is consequently bad. We do not look for stars in such situations, and are annoyed by them presenting themselves in such unnatural positions. A very legitimate kind of ornament for the walls of rooms seems to be well-balanced geometrical combinations of leading forms, —well-proportioned panels or spaces, with combinations of foliage, the configuration of which has been carefully copied from nature, and which, in my opinion, cannot be too homely, nor too familiar. I trust, however, that the time is not far distant when artists of high talent will not consider it beneath them to paint representations of life on such spaces, and this must ever be considered the highest order of wall decoration.

If the primary colours require to be used in their fullest intensity, they may be introduced into such combinations with excellent effect. They ought always, however, to be employed sparingly—a circumstance which will at once enhance their brilliancy, and prevent them overwhelming the secondary colours and neutral tints that enter into the design.

The effect of gilding on an apartment, when judiciously introduced, is highly poetical. It gives a new and more elevated character to everything in the room; while, without it, the finest designs look tame, flat, and insipid. Gold ought to be employed liberally in adorning cornices; and in almost all cases the primary colours can be used in connexion with it in their fullest intensity with excellent effect. On the other hand, the richest furniture loses half its effect when placed in a room in the decoration of which no gold has been employed. Under the influence of artificial light, gilding becomes still more imposing, and at all times, and in all places, the effect is exceedingly agreeable. One familiar example will sufficiently illustrate the truth of this remark.

Perhaps there is no portion of the detail of a building on

which the Architect bestows more care than on the ballusters of a staircase railing; and they are in many instances very graceful in form. But it often happens that they are left to the merciless brush of some unskilful house painter, who daubs them over with a staring green, or some other equally inappropriate colour, to the utter ruin of the effect of the Architect's taste and skill, as exhibited in these specimens of his art. Bronzed ballusters look very well, but when gilded, the effect is greatly enhanced. The character of the entire vestibule and staircase is elevated, and the visitor, on his first entrance into the mansion, is impressed with ideas of grandeur and magnificence.

On the mouldings of all panelled ceilings, whether enriched or plain, gold may be used with excellent effect. When a gold lacquered chandelier is suspended from a central flower or patera, the latter should be one mass of solid gilding. If, on the contrary, the body of the chandelier be coloured, and the prominent points only hatched with gold, the patera should be coloured and hatched in the same manner. By such treatment, the patera and chandelier are, as it were, united, and the effect of this leading piece of ornamental drawing-room furniture is materially enhanced.

An opinion very generally prevails that the use of the positive colours on the walls or ceiling of a room tends apparently to contract its dimensions. This is an erroneous idea, and could have its origin only in the unskilful manner in which the positive colours are often used; for they are like edge tools—they must be handled cautiously and dexterously; and when so handled, they are capable of producing the most gorgeous effects. The paintings of the Venetian school are remarkable for their richness and brilliancy. In all the works of the great masters of that school the positive colours are used in their fullest and deepest intensity; but instead of

the pictures being diminished in apparent size by such treatment, their dimensions seem to be increased. Where similar principles are applied to the decorations of a room, similar results will necessarily follow.

The use of paper hangings has of late years become very general, and the reduction of duty on French papers which has taken place will certainly have a tendency to improve the manufacture of English paper-hangings, by engendering a new spirit of competition in the trade. Nor can there be any doubt that we shall shortly rival, if not surpass our neighbours, in this department of art, as we have already done in the manufacture of other commodities. For my own part, I must say, that many French paper-hangings which I have seen, though certainly remarkable for their skilful manipulation and delicate blending of colours, are by no means all that I should desire this species of decoration to be. The leading forms appear to me to be neither sufficiently distinct, nor sufficiently simple; and, consequently, in large apartments they appear *petit* and out of place. The attempt so frequently made in such cases to represent foliage in relief appears to me to be injudicious, as suggesting ideas of confusion and disorder. The flat configuration of Egyptian or Moorish ornament, filled in with tints of well-balanced colour; and defined by decided outlines, I consider infinitely preferable. The Chinese paper-hangings, with all their crudities and absurdities, are remarkable for their balance of colour; while the colours themselves are so pure and decided, that even in artificial light the eye can discriminate between any tint as well as by the light of day. The blues and greens, which in our paper-hangings, and even on our painted walls, entirely lose their identity in artificial light, retain their distinctive qualities on the Chinese papers. In one quality, however, both the Chinese and French paper-hangings seem

materially deficient—a deficiency which may be attributable to certain leading characteristics of both nations. This is repose, an essential in all great works of art, and especially required in British decoration. There should indeed be repose as well as brilliancy in all designs. Where all the parts are equally dazzling, the eye is pained and bewildered rather than pleased. What the middle distance is to a landscape, the due proportion of neutral tint is to ornamental decorations; and a considerable preponderance of such repose is in accordance with the staid character of the British people. What, for example, can be more out of keeping with the genius of British commerce than the petty scraps of foreign ornament, equally destitute of originality and grandeur, with which the ceiling and walls of the Royal Exchange in London are decorated. The former has no sympathy with the latter—the latter none with the former; and as to the emblems, if they have meaning, few understand what that meaning is, and fewer still care. One thing, however, is clear—nothing we see there appeals to any British feeling, or is calculated to awaken any association in any British bosom.

I have to regret that the limits within which it is necessary to compress a paper of this kind compel me to pass over many points connected with interior furnishings and furniture, on which much might have been said. One very common error, however, I may allude to, which is the introduction of French pier tables and French mirrors into drawing-rooms where the architectural features are all Grecian—an absurdity similar to the introduction into Westminster Abbey of those so-called classic monuments with which the pure Gothic architecture of its magnificent aisles is desecrated. In furnishing, as in decorating, unity of style and purpose is indispensable. Without these there can be no harmony—no consistency.

These observations I have now to conclude with a few general remarks.

Perception of beauty seems an inherent quality of the human mind; and man generally attains considerable skill in ornamental art before he has acquired any knowledge of the arts which contribute more immediately to his social comforts. Even in his rudest state, the productions of his taste and skill are often remarkable for their symmetrical beauty and delicate manipulation. The South Sea Islanders, with no other tools than such as they manufacture from sea shells or bits of talc, produce specimens of carving closely approximating in excellency to the best efforts of our best artists; and in several authenticated fragments of ancient British art are to be traced vestiges of ornamental detail remarkable for beauty of design and delicacy of execution. The adornment of the person seems to be the first stage in the adaptation of natural objects to decorative art. The child bedecks himself with daisies—the savage paints his body with ochre. When this propensity for adornment is extended to the dwelling-house, it evinces a more advanced stage of refinement and of social civilization. Let the trophies of war, then, which bespeak the barbarism of the age that adopted them, be scattered to the winds, and let our ornamental devices be taken from the flowers of our fields—not fields of battle, but fields of peace and happiness; and thus shall our dwelling-houses be adorned with emblems suggestive of the domestic happiness and comfort of our own beloved country.

EDINBURGH, *9th January* 1851.

PLATE I.

Figure 1.

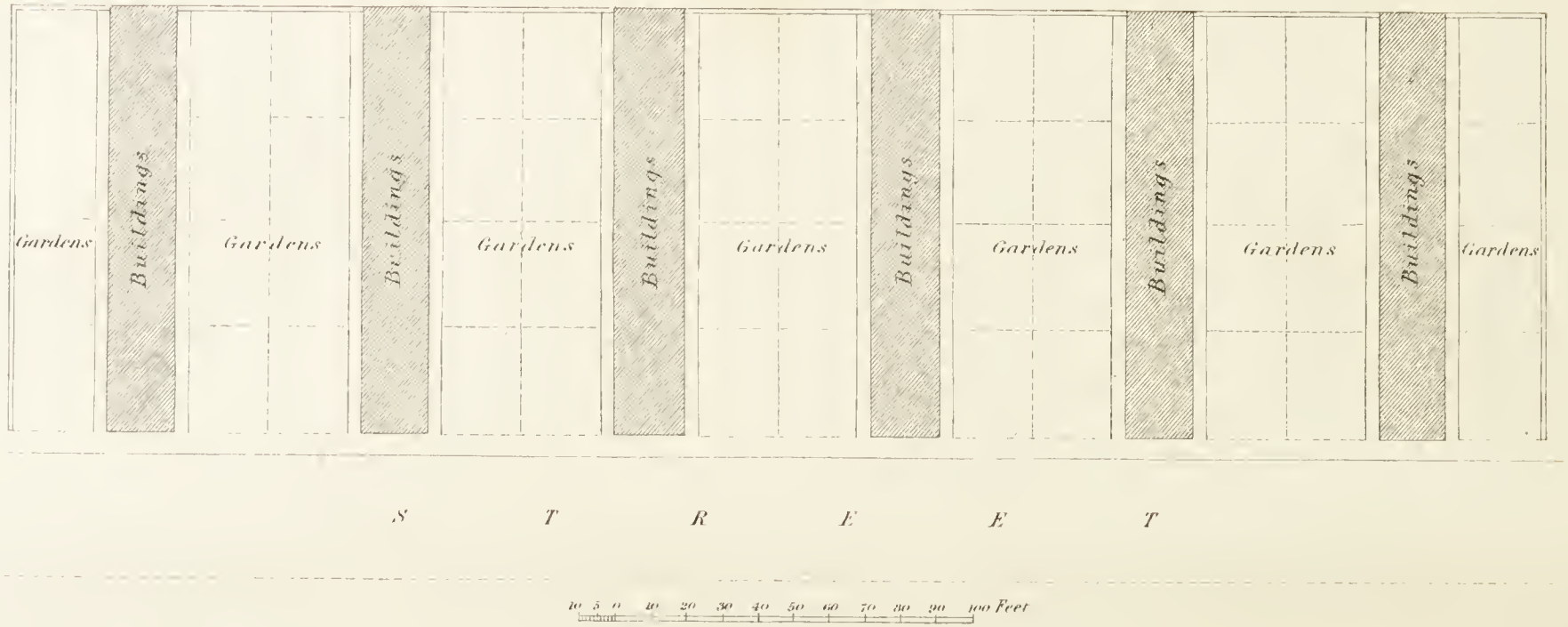


Figure 2.

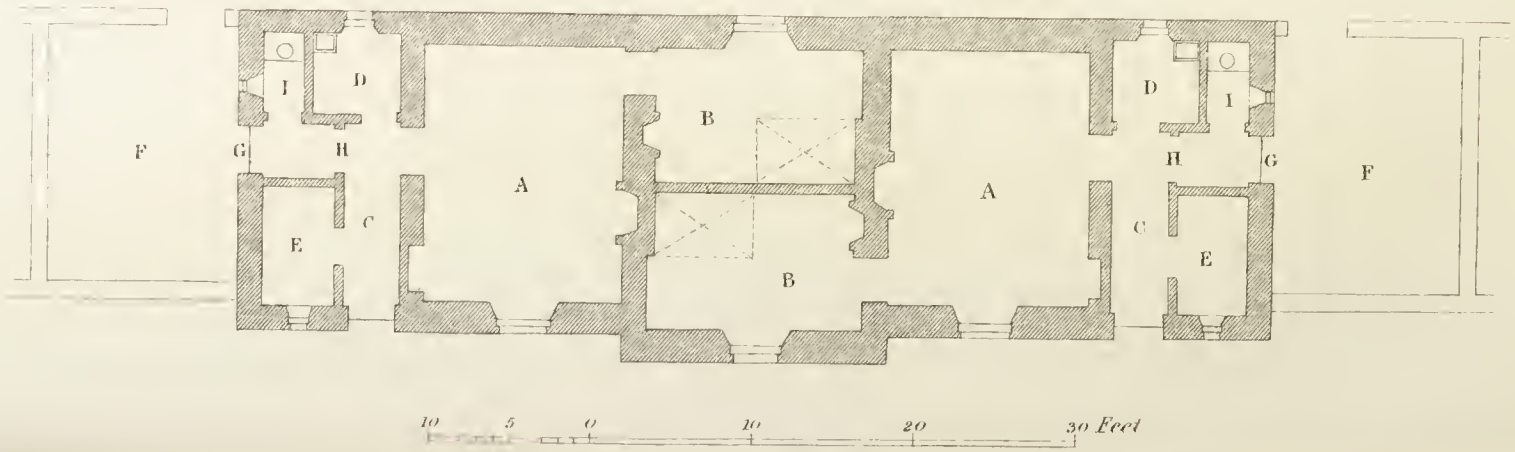
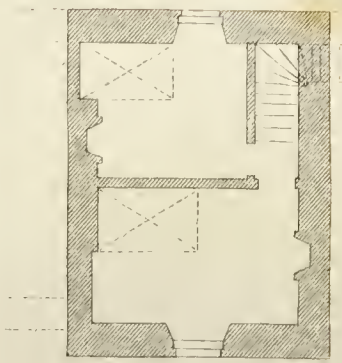
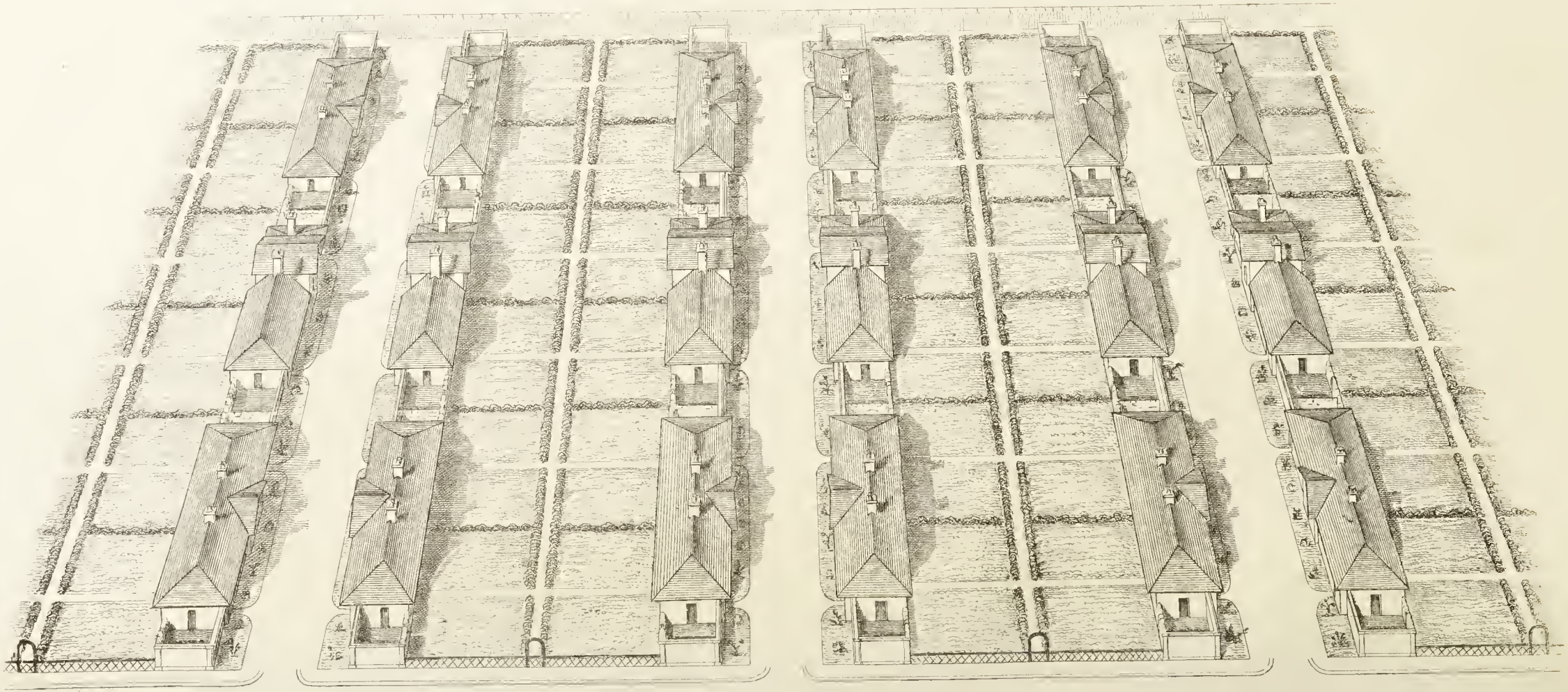


Figure 3.



W H Lizars Sc.

PLATE II.



W.H. Lizars Sc

Transactions of the Architectural Institute of Scotland.
Session 1850-51.

No. VI.

ON COTTAGES FOR RURAL DISTRICTS.

BY

PATRICK WILSON, Esq., Architect, F.A.I.S.

My Lord Duke,

I must crave the indulgence of your Grace and the Institute, while I throw out some observations regarding Cottages for Rural Districts, as it was only to-day I was requested to take part in the proceedings of this evening.

Aware of the attention which your Grace has devoted to this subject, I certainly approach it with no little diffidence; but having had my attention recently directed to improved dwellings for the working-classes in towns, and although a difference does exist in the accommodation and arrangement required in houses for a town population from those in the country, still, I think the plan I have adopted for workmen's houses would, with some alterations, be equally well adapted for an agricultural or mining population.

The principle on which I set out in these town houses was, to make each tenant entirely independent of his neighbour,—in other words, to give to each what is known by a self-

contained house. This, it may be said, is the case with all *cottages* having separate and distinct accesses. To adopt the cottage plan in towns would involve, however, a sacrifice of ground which cannot be attained, and increase the expense of the buildings beyond the reach of journeymen tradesmen. To accomplish, therefore, the scheme of self-contained houses at the least possible expense, I proposed two-storey buildings, the houses on the under floor entering from the one side, and those on the upper floor from the other side. Were houses on this plan placed in rows parallel to the public road or street, passages must be formed through the under storey, in order to get to one side of the building. These passages not only occupy space, but often prove a great nuisance. To avoid this evil I adopted the plan of placing the rows of houses at *right angles to the road.* Figure 1, Plate I, represents a piece of ground laid out upon this plan, upon which there are six rows of houses, the intervening spaces being appropriated for gardens or greens, each family having a garden distinct for themselves.

This plan, in my humble opinion, presents several advantages. No ground is lost, the whole of the vacant spaces between the buildings being occupied as gardens, excepting a foot-path on each side of the houses. There is no common property, and the families do not come into contact with each other. A free circulation of air is admitted all round the buildings; and being regular parallelograms, without projections of any kind, all corners for the accumulation of nuisances are avoided, and the houses being exposed to view on all sides, cleanliness can be more easily promoted.

I may mention that all the houses contain at least two apartments, some of them three, besides a well-lighted scullery,—sufficiently large to answer for a washing-house,—a

water-closet, and other conveniences. Each house on an average costs from £80 to £85.

Houses of this description are now erecting in the vicinity of Edinburgh, and some have been finished and occupied for about nine months. I am glad to say they are answering the expectation of the benevolent gentlemen who have thus started the project of obtaining a better description of houses for the working classes.

Such a plan as I have been describing would, I think, be well adapted for miners' houses.

The same arrangement may be advantageously followed in cottages for rural districts.

The usual plan of placing cottages in rows, running parallel to the public road, is objectionable for several reasons. Although, from being exposed to view, the front part of the cottage may be kept in tolerably good order, the back parts are often very much neglected. The children are not only exposed to accidents, but are found troublesome to parties passing along the road, especially equestrians. Again, when cottages are placed in a continuous connected line, the yards and ashpits must of necessity be placed *behind* the houses. Hence any effluvia from these must less or more enter the houses when the windows on that side are open.

Plate II. represents a bird's-eye view of a piece of ground laid out on this plan, in six rows of cottages, with their gardens and roads of access. Flower-plots are intended in front of each cottage, the part in the middle of the road to be laid with gravel, affording ample space for the children playing about, and thus keeping them off the road. These flower-plots will not only test the orderly habits of the cottagers, and add to the external appearance, but will also prevent any nuisance near the walls. In place of the yards being behind, I pro-

pose them placed between the houses; which arrangement removes the objection of nuisances being placed in front of the back windows, while, at the same time, it keeps them out of the public view.

Figure 2, Plate I, is the plan of two cottages; A A are the kitchens, each with a bed-room, B B, entering from it. I consider it of advantage in some respects for the room to enter from the kitchen; it partakes partly of the heat from the kitchen; indeed, by a very simple arrangement made with fire-brick pavement, heat may be obtained more directly from the kitchen fire-place. I have, however, provided a small fire-place in each bed-room.

There may not be much that is new in this plan of the house; but, so far as I am aware, the manner of arranging the yards or courts between the cottages, in place of behind, is a new idea, and possesses another advantage besides the one already pointed out—in affording a better access to the houses and their offices. The usual mode of having the door to the kitchen close to the outer door, with a small lobby about four feet square, is objectionable, for this reason, that the door is close upon the window. In my plan the space near the window is thrown quite out of the current between the door and the fire-place. From the passage C, access is got to the scullery D, pantry E, and to the court F, and through it to the garden. Besides the outer door G, a door is intended to be placed at H; between these doors is the entrance to the water-closet I, which, for economy in plumber work, is placed in close proximity to the sink in scullery, but separated from it by a partition. The back wall of the court is a mere screen, and need not be very high. In the court provision is made for coals and ashes. By increasing the size of the court, a new house may also be got within it. In

that case the back-wall would require to be higher, and the court shut in with a door or sparred gate.

The garden-ground would be divided, so that each family would have their portion immediately behind their dwelling. To induce a spirit of emulation in keeping the gardens neat every part of them should be exposed to view as much as possible. I propose therefore a paling or open fence of some kind along the public road; a walk in the centre between the rows of gardens, shut in with a gate, which walk may be continued round the further ends of the cottages. The proprietor or his friends could thus have an opportunity of observing how the whole of the premises were kept.

The soil would be conducted away by drains to a tank placed at a suitable distance from the houses, and preserved for manure.

The plan of cottages which I have adopted is simple; but it will admit of the elevation presenting a neat appearance, although built in the plainest style. Or if ornamental buildings are required, these double cottages, detached by a neat plain wall, with a moulded cope, would afford every facility. Porches at the doors, projecting a little from the wall, and a bay window substituted for the plain one, would add much to the external appearance.

Where larger cottages are required, the centre part can be raised a storey higher, and finished with an ornamental gable end, which would have a good effect. Were the centre pair of cottages in each row built on this plan, a variety would be produced, and the monotony of the whole relieved.

In these cottages, enlarged by raising the centre part of the building, I propose the two bed-rooms on the lower floor to enter from one kitchen, and the two upper ones from the other. Each house would thus consist of a kitchen, two bed-

rooms, and the other conveniences already described. One stair only would thus be required for the double cottage, and would be formed as shewn on the plan of the upper rooms, Fig. 3, Plate I. A separate access is thus obtained to each of the upper rooms. The stair would be separated from the lower bed-room by a partition, a stance for a bed being got under it.

EDINBURGH, *9th January* 1851.

Transactions of the Architectural Institute of Scotland.
Session 1850-51.

No. VII.

ADDRESS

DELIVERED AT THE FIRST MEETING IN GLASGOW OF THE ARCHITECTURAL INSTITUTE OF SCOTLAND.

(30th January 1851.)

BY

ARCHIBALD ALISON, Esq., LL.D.,
SHERIFF OF LANARKSHIRE.

Gentlemen,

The formation of an Architectural Institute in Scotland, and the extension of a branch of it to Glasgow, I cannot but regard as a favourable omen of the progress of art in this country generally, and, in particular, of the increased interest that it is awakening among our own citizens. It is in vain that a nation is great in arts and arms—in vain that its dominion is extended, its riches increased, its colonies multiplied, and its power respected,—if it does not excel in the fine arts, it has not reached its proper elevation, it is not destined to leave a durable name among mankind. If you look back to the history of former times, you will find that nations, how great, how powerful, how illustrious soever during the period they existed, have sunk down, and been lost in the obscurity of forgotten age, if their names have not

floated down the stream of time, buoyant by the lustre of their eminence in the Fine Arts. The states to which we revert with reverence and respect are not those which have signalized themselves merely by the desolation of war, or by the magnitude of their conquests. We do not look back to the triumphs of an Attila, a Tamerlane, or a Genghis Khan: we fix our eyes on the days of Athens, of Egypt, of Persepolis, of Rome, of Venice, of Genoa, or of Florence, or other nations whose eminence in the Fine Arts has rendered their name immortal. These are the eras on which the patriot loves to dwell; and these are the countries on which the attention and admiration of mankind have for ever been fixed. If you find a people great in the mechanical arts, whose riches are unbounded, who have all the luxuries and all the appliances of life at their command, but are destitute of taste in the Fine Arts, rely on it, that that people are only mid-way in the career of civilization; that they have not arrived at perfection, but are only beginning to emerge from mediocrity.

Gentlemen, the Fine Arts are the true test of civilization. They are the last and highest stage of progress; they mark the period of efflorescence 'slow to come, soon to perish,' as Tacitus said of that in which regulated freedom prevails, in which the efforts of former times, the wealth acquired by industry, are fixed by genius, and united to personal exertions and to the force of imagination. As the Fine Arts are the highest effort of human genius, we shall find that these Arts, and that of Architecture in particular, have flourished in every country in proportion to the extent of its cultivation; and so far from its being true that greatness in any one of its departments draws all the talent to that line, and takes it away from others, the real effect is, that talent is excited in a greater degree in all departments, by its simultaneous exis-

tence in others, and genius advances abreast in all the arts and sciences. Can we forget that the brilliant era of Grecian history—the era which embraced the poetry and the drama of Euripedes and Sophocles, with the wisdom of Socrates, the history of Thucydides, the brilliancy of Aristophanes, the eloquence of Pericles, which almost heard the oratory of Demosthenes, was also graced by those illustrious artists and sculptors, Phidias and Praxiteles, who added the Parthenon to the glories of the Acropolis. If we look to the history of Rome, we shall also find that that period of its greatness, when Augustus found it a city of brick, and left it of marble —when the foundations of those edifices were laid which still attract the admiration of the world—that period was also the age of Virgil, of Ovid, of Horace, of Cicero, of Livy, of Sallust, and of all the great men who have rendered the name of Rome immortal. It was the same with the Arts in Italy, in Venice, in Genoa, in Florence, and in all the cities of Europe. It has universally been found that the Fine Arts have advanced abreast with the genius of man in other departments. In the history of human thought, so far is it from being true that one branch of thought has drained another, we shall find that they have always kept pace, and that the fire of genius has been struck out by the collision of one with the other.

Gentlemen, among the various Fine Arts, the one which appears, from what I know of the past, and see of the present, and which is, I may say, the most indigenous to this country, is the art of Architecture. The art of Painting, the art of Sculpture, and to a certain degree, the art of Poetry, require a fostering care, and have been found to exist and flourish when a nation has advanced far in the career of wealth, and already acquired great distinction in science and poetry; but we can never

forget that the art of Architecture appears to have been indigenous to our soil; and that the greatest and noblest structures that yet exist in Great Britain were erected at a time when in every other department of thought the people were in a state of infancy. We have only to look at our cathedrals and monasteries—we have only to go to our own Cathedral, and see its nave, founded in 1120, and behold the secret beauty of its subterranean crypt, which is perhaps unequalled in the world; we have only to recollect that that exquisite edifice, which all the genius and skill of modern art has not been able to rival, was constructed 700 years ago, at a time when the country was everywhere sunk in barbarity, and when hardly a baron had a house to live in that was secure from the weather, or possessed a tithe of the comforts that are now within the reach of the meanest mechanic, to be convinced that if other of the Fine Arts require the fostering hand of care, Architecture can flourish of its own native strength in our land.

As the art of Architecture is the one which appears to be the native and robust child of the soil, and not the delicate child of our conservatories, so it is one which is calculated to do more than any other art can do in elevating the tone of mind, and improving the taste of the great body of mankind. We must always recollect that in this country other branches of art cannot be exposed to the open air. The effects of the climate would very soon destroy the finest marble statues of Phidias, and the expense of making statues in bronze can only be incurred on particular occasions, or for very illustrious individuals. We all know that paintings are displayed in rooms and galleries, and it is very seldom that they are made accessible to the great portion of mankind. But Architecture has this immense advantage, that from first to last its structures are open to the gaze of all the world. When

its edifices have been raised, the genius of the age which erected them is not confined to that period; but the structure stands the revolutions of the seasons, through winter and summer, to excite the eternal admiration of every succeeding generation. We now look on the Cathedral of Glasgow, after the lapse of seven hundred years, with the same admiration, and inhale the same delight from the contemplation, which our ancestors felt at the remote period when they had the magnanimity to attempt, and the perseverance to complete, such a glorious structure.

Now, as the great object of the Fine Arts is the improvement of the mind, the nation which has attained the highest excellence in them, is the nation that is destined to leave the most durable name in the world. The object of Art being the elevation and improvement of the general feeling, nothing tends so much to elevate the general taste, to refine human life, and add to the dignity of human nature, as the great works of its Masters. There is no art which accomplishes these objects so well, and so lastingly, as Architecture; because, of all the departments of the Fine Arts, it is that alone which is exposed for ever to the eye, and operates insensibly on the mind of the whole people, exciting general admiration for beauty, even while going about our ordinary avocations in the streets.

Gentlemen, I will add as an additional circumstance, which distinguishes Architecture from all other arts, that it is a great and lasting record of a nation's greatness. All other records may perish by the influence of time. There is no saying but even the productions of genius, which are perpetuated by the press, if not buried by the waves of time, may be buried by the waves of succeeding volumes. No man can affirm that the efforts of genius, even of a Milton or Shakspeare, are destined to eternal duration. But it is

otherwise with the great works of Architecture. Look we to the past history, to the annals of mankind for four thousand years, and it will be found that, of the productions of genius, Architecture alone erects its monuments of immortal duration, which remain as permanent as the granite, or freestone, or marble, of which they are constructed, and attest more than written annals a nation's greatness. Consider the land of Egypt, and how few traces of its ancient greatness have survived in written history: but look to its monuments, and we shall see the temples of Karnak and Thebes still standing amid the sands of the desert, as sharp and as beautiful as when the armies of Sesostris defiled through them three thousand years ago. If we think of Nineveh, we cannot but recollect that the genius and perseverance of one Englishman, of Mr Layard, has, after the lapse of nearly four thousand years, disinterred from a depth of fifty feet those exquisite remains which have survived through all the subsequent revolutions of time in unmutilated and undecaying beauty, and which, verging as they did on the first ages of mankind, almost remind us of the days when the waters of the deluge receded from the earth—when the glory of the resplendent bow was seen in Heaven—and when the dove returned to the ark with the olive branch, the mark of reconciliation from Heaven to a suffering world. They carry us back to the time

> 'When on the green undeluged Earth,
> Heaven's Covenant thou didst shine;
> How came the world's grey Fathers forth
> To watch thy sacred sign.'

If we think of Italy, what relics of the past may be seen in its eternal monuments! We behold the temple of Neptune, and other temples at Pæstum, still standing, hoary with

age, but yet erect and undecayed, in the desert of the Campagna, with which they are surrounded. They were old when Rome was young—they were surrounded by numerous and luxurious multitudes when the Palatine Hill was still tenanted by the wild beasts of the forest, and when the wolves still wandered in the plains of Latium that were destined to suckle the founders of the conquering republic. If we think of Athens—if we call to mind the Acropolis, still studded with the monuments and exquisite remains of Grecian art which have attracted the admiration of 2500 years, let us reflect on the vicissitudes of time which they have seen, and let any man say, does even the genius of the painters, of the dramatists, of the poets, or of all the other illustrious men of Athens fix itself on the memory—does it convey the same feelings which are awakened by the sight of that marvellous assemblage of beauty, and all its remains of sculpture and architecture on which the sun still pours his rays in undiminished glory, in which the chiselling of the sculptor, in so far as it has not been defaced by man, is as fresh as when it came from the hands of Phidias, and in which all the subsequent revolutions of time have been unable to efface the stamp that genius fixed on it thousands of years ago. I cannot refuse myself the pleasure of reading to you a passage from Chateaubriand, which conveys a vivid idea of the impression made on his mind from the wonderful accumulation of beauty that exists in the remains of the Architecture at Athens :—

'I have seen from the rock of the Acropolis the sun rise between the two summits of Mount Hymettus; the ravens, which nestle round the citadel, but never fly over its summit, floating in the air beneath, their glossy wings reflecting the rosy tints of the morning; columns of light smoke ascending from the villages on the sides of the neighbouring mountains, marked the colonies of bees on the far-famed Hymettus; and the ruins of the Parthenon were illuminated by the finest tints of pink and violet. The sculptures of Phidias, struck by a horizontal ray

of gold, seemed to start from their marble bed by the depth and mobility of their shadows; in the distance, the sea and the Piræus were resplendent with light, while on the verge of the horizon the citadel of Corinth, glittering in the rays of the rising sun, shone like a rock of purple and fire.'

We cannot, gentlemen, be sure that the civilization or greatness of our own times is to remain. We cannot tell that the time may not come when the chief capital cities of Europe, like the great cities of antiquity, may be exposed to ruin and decay. The time may come when the traveller shall ascend the ruined summit of St Paul's, and look to the scene which surrounds him with the same impression with which he now stands on the summit of the capitol, and sees the remains of the baths, of the noble temples, of the pillars of Rome rising round him in every direction—the remains of the mighty aqueducts which brought the floods of the Appenines, from a distance of fifty miles, into the heart of the city, and sees also the dome of St Peter's, the greatest work ever raised by the genius of man to attest the triumph of faith over all the vicissitudes of time, rising in gloomy grandeur in the distance. The time may come when future ages shall survey the ruins of Paris and London in the same manner as they now survey the ruins at Athens and at Rome; but the eternal monuments of the greatness of the two empires will still exist. Paris possesses the most wonderful remains in the world, as shewing the durability of Architecture through all the vicissitudes of time. From the baths of Julian the Apostate, now degraded to the humble purposes of a cooper's shop, to the noble pillar of Austerlitz, which commemorates the triumphs of Napoleon, the French capital exhibits a succession of temples which extend like a huge bridge across the long lapse of fifteen centuries, and possesses structures of every century during that time, which,

by their varied but yet imposing character, tend to illustrate, to demonstrate, and to perpetuate the progress and greatness of the French empire. The time may come, when London itself may be laid in ruins ; when Westminster Bridge, and a few great structures of ancient times may alone exist to tell what the great metropolis was, and when the dome of St Paul's may stand in solitary grandeur near the unpolluted waters of the Thames. The period may recur, when the plains of Yorkshire shall be covered again with forests, from which they have been cleared by the laborious hand of man ; and when a second Gurth and another Wamba may attend their swine amid the renewed forests that cover the country ; but even then, the towers of York cathedral will stand in undecaying beauty amid the ruins of the surrounding nation, and travellers from all parts of the world will hasten to the spot which attests at once the piety, the magnanimity, and the tastes of the early ages of England.

Gentlemen, there is another consideration. Architecture is an art which has risen to its greatest eminence in commercial cities. I need not tell you, that Athens was a commercial city—that it was one in which the wealth acquired by commerce with its colonies, was the means of raising those structures which have rendered its name immortal. I need not remind you that the still stately place of St Mark's at Venice was raised by the commercial wealth of the Queen of the Adriatic, and that the magnificent edifices of Genoa, second to none in Europe, were erected by the wealth that flowed into that maritime republic, which was possessed of a commercial spirit second only to that evinced by the British people in after times. But there is another instructive instance of the manner in which a great commerce can produce the most wonderful structures, and by means of which, I again repeat, the most durable monuments of antiquity have been

raised. Egypt was a mere strip of land—the valley of the Nile a narrow tract, seven hundred to eight hundred miles in length, and from three to four in breadth, extending through impassable and perfectly sterile masses of rock and sand. Its whole wealth arose from the floods of the Nile, and the great commerce which descended by it from the interior of Africa and from the Red Sea. We have no written records of the greatness of Egypt in former times; but the Pyramids still stand erect and unshaken above the floods of the Nile to attest the glory to which it had attained. Another still more memorable instance of the way in which commerce can produce the most wonderful results, is to be found in the ruins of Balbec and Palmyra, which exist in the midst of the deserts of Arabia. These cities were second to none in the world for the number and luxury of their citizens, and yet they owed their existence entirely to a vast external commerce. They were the channel of commerce between the East and the West, between India and Europe. The route by the Cape of Good Hope not having then been discovered, the highway which they bestrode was the only medium of communication. These great cities entirely arose from the passage of the caravans that conveyed the wealth of the East to the West, and it was the riches which this traffic created, which produced those structures which still excite the astonishment of man. I shall read to you a passage of the celebrated Lamartine, descriptive of his first impression on visiting the ruins of Palmyra, on seeing the wonderful extent of its ruins, and remarking the surprising effect that commerce can have in furnishing both the wealth and the taste requisite for Architecture:—

'When we reached the summit of the breach, our eyes knew not to what object first to turn. On all sides were marble gates of prodigious height and magnitude; windows, or niches, fringed with the richest

friezes; fallen pieces of cornices, of entablatures, or capitals, thick as the dust beneath our feet; magnificent vaulted roofs above our heads; everywhere a chaos of confused beauty, the remains of which lay scattered about or piled on each other in endless variety. So prodigious is the accumulation of Architectural remains, that it defies all attempt at classification, or conjecture of the kind of buildings to which greater part of them had belonged. After passing through this scene of ruined magnificence we reached an inner wall, which we also ascended; and from its summit the view of the interior was yet more splendid. Of much greater extent, far more richly decorated than the outer circle, it presented an immense platform in the form of a long rectangle, the level surface of which was frequently broken by the remains of still more elevated pavements, on which temples to the sun, the object of adoration at Balbec, had been erected. All round that platform were a series of lesser temples—or chapels, as we should call them—decorated with niches, admirably engraved, and loaded with sculptured ornaments to a degree that appeared excessive to those who had seen the severe simplicity of the Parthenon or the Colisseum. But how prodigious the accumulation of architectural riches in the heart of an Eastern desert! Combine in imagination the Temple of Jupiter Stator and the Colisseum at Rome, of Jupiter Olympius, and the Acropolis at Athens, and you will yet fall short of that marvellous assemblage of admirable edifices and sculptures. Many of the temples rest on columns seventy feet in height and seven feet in diameter, yet composed only of two or three blocks of stone, so perfectly joined that to this day you can barely discern the lines of their junction. Silence is the only language which befits man when words are inadequate to convey his impressions. We remained mute with admiration, gazing on the eternal ruins.'

Now, gentlemen, if such are the structures which, after the lapse of two thousand years, still remain to attest the vivifying influence of the internal commerce which flowed through Balbec and Palmyra from the east to the west—if our own cathedral exists to the present day to tell us what was the spirit and what the magnificence and the taste of our own ancestors seven hundred years ago, when all Scotland could not boast of one tithe of the wealth which this city can now alone present;—when we reflect on these things may we not

reasonably hope that the time is yet to come—perhaps is not far distant—when the taste for the artistical decorations of those noble edifices which Architecture alone can raise, may be so far extended by the wealth and commerce of this city—and we enjoy a far greater commerce than ever vivified Athens or Thebes, or flourished in Florence or Palmyra, or any of the other cities which now exhibit those splendid ruins—that we may erect structures of eternal duration, which, after the lapse of another two thousand years, may attract the attention and the admiration of a second Chateaubriand or another Lamartine, when they in their turn may come from distant lands—it may be from Australia, New Zealand, or the vast plains of America—to visit the scenes of their fathers, the monuments commemorative of their achievements, and the works that attest their glory and their genius.

There is another circumstance which appears to shew that Architecture is an art, like all the Fine Arts to which it is nearly allied, founded in the noblest principles of our nature, and that it has been found that the greatest edifices that have ever been erected by human hands have been raised for the purposes of religion. If we examine the structures which have impressed the mind of every cultivated man—whether he has seen them himself or only read of them—we shall find that those that have made the liveliest and deepest impressions are neither the triumphal arch that commemorates the achievements and the devastating march of the conqueror, nor the bridges which bestride the noblest rivers, nor the aqueducts which traverse vast plains, nor the palaces which were once the abodes of imperial greatness; but they are the temples which evince the piety of past generations—they are the cathedrals which have been raised by the devoted spirit of our ancestors to give vent to those feelings which are as universal in the human heart as the human form is in the

material world. The Architecture of antiquity reached its highest elevation in the temples of Greece and Rome. It is to them that subsequent ages turn as the most perfect specimens of devotional Architecture. It would appear that the human mind in Greece, being turned to the expression, by the genius of art, of the feelings of piety and devout adoration that ever dwell in the heart of man, had there attained a degree of perfection to which no subsequent efforts of any other age have ever been able to attain. I know no country but where, as in all parts of Europe, the most beautiful structures, which attract the admiration of every person, are the cathedrals, monasteries, and the remains of sacred edifices. We know from Washington Irving—a man second to none for taste and discernment,—that when he came to visit this land of his forefathers, it was neither its plains nor its fields, its gardens, its palaces, its parterres, its political greatness, nor its literary renown that affected his imagination—it was the remains of its monasteries, its spires, and cathedrals that were indelibly engraved on his recollection, because he says America can show all other things, but America had no past—no monuments like those to attest the piety of former times.

To shew that Architecture, like sculpture, attests the best feelings of our nature, the greatest structures ever raised by the hands of man, which have excited the eternal admiration of every age and clime, are the Parthenon at Athens, St Peter's of Rome, and St Paul's of London. The cathedrals of England and France have, one and all, been raised to the purposes of religion, and intended to give vent to the noblest feelings that ever animated the human breast, the feelings of gratitude to our Creator.

Being myself not a practical architect, I feel a distrust in approaching the next subject—it is that which appears to me

to be the principles on which beauty depends in Architecture. I should have great difficulty in addressing you on this subject, as I can only profess to be an amateur architect, did I not feel perfectly persuaded that the same principles pervade all branches of the Fine Arts. Painting, poetry, the drama, history, sculpture, all depend on the same principles. The principles of beauty are identical in all the different modes in which expression is to be given to some train of thought, and in which emotions of a similar kind are to be awakened in the mind; and having been myself engaged in one of these arts, I may be permitted to make a few observations on the principles on which beauty is to be obtained in another. I am perfectly persuaded that if we examine what are the feelings we have when we see a beautiful object, whether a landscape in nature, a fine painting, a beautiful drama on the stage, read a magnificent poem, hear a splendid speech, or enjoy any other production of human genius, we shall find that the delight is always one and the same thing, and proceeds from one and the same source. It is the exciting in the human mind of one uniform emotion from a great variety of subordinate details that occasions the charm. The secret, therefore, of success in all the Fine Arts is to be found in the awakening from a multitude of details this one emotion; and this is to be done by *combining speciality of beauty with generality of effect.* If we look to the most minute object in nature in this light we shall find it is the combination of a number of things producing one effect that is the source of admiration, and that gives us pleasure. It is something akin to the effect of the melody of the different notes of music, or of the harmony of different wind instruments in a magnificent band falling on the external ear. It is melody brought into the mind, by one common result being produced by a variety of details. This uniformity of emotion is pro-

duced in many ways. Contrast has often great effect in bringing it out. What I maintain is, that the object of the artist should not so much be to exhibit uniformity of detail, for that is monotony, but uniformity of *emotion*, and that is often best attained by variety, provided it all tends to one point. He should endeavour to produce one uniform emotion by a general contemplation of the whole, and every subordinate part should tend to the same object. Look at a picture of Claude Lorraine, Salvator, or Ruysdael, and you will find that in every part the painting is executed with the most scrupulous minuteness—every cloud casts its shadow, every wave of the sea is dancing under the rays of the sun, and every object is represented with the most scrupulous accuracy; but, nevertheless, it is one uniform unity of emotion that is produced, and that unity of emotion will be felt as strongly under the magnifying glass, as when you go to such a distance as only to see its general effect. If we look at one of our great dramas, when represented by an artist of the highest genius, we shall find that the secret of success arises from diffusing one prevailing emotion from a great variety of details; and perhaps the most serious objection to be made to our great dramatist, Shakspeare, is to be found in the practice he indulged in, of breaking up the unity of emotion altogether. Perhaps his object was by the force of contrast to increase the general impression, just as a painter would give deep shadows in order to bring out the light parts of a picture.

I will now point out the way in which the principle of combining generality of effect is applicable to Architecture. Look at the buildings which are most perfect and beautiful, and we find that by combination of beauty with individual parts we form the emotion derived from the aspect of the whole edifice, and the whole thing is done by only looking at the building. Com-

pare the Temple of Neptune with the Parthenon at Athens; they are both Doric temples, but in the Parthenon there is superadded to the naked dignity of the Doric form the exquisite beauty of friezes, of cornices, and of sculpture in the pediment—and the unity of emotion produced is such that every traveller who has ever seen it has felt but one emotion, as if he were looking at the most minute and beautiful object in nature. The unity of feeling is felt in the same manner as on hearing a magnificent band playing in harmony. The same thing may be said of every magnificent building—our own Cathedral—those of York, of Lincoln, of Amiens, or of Rouen. The present noble edifice going up at Cologne under the auspices of the King of Prussia is another example of the same truths. However minutely you look into it at all the different parts—its flying buttresses, its ornaments, and its beautiful roof—the style is such that on looking at it all feel the same unity of emotion, from the fact that the effect is the same, upon looking at its most minute parts, as when you examine its general effect from a distance.

As an illustration that mere beauty of detail without generality of effect will not succeed in creating beauty in Architecture, I would also appeal to the New Houses of Parliament at Westminster. If we look at them in detail, it is impossible to imagine more exquisite beauty of ornament than is to be found there. Every part of the structure, both externally and internally, is redundant with beauty of detail; but when we go to a distance, we can never compare it with one of our old English cathedrals; and what is the reason—the artist has attended only to speciality of beauty, and not to generality of effect. And why? Did our old architects exhibit long ranges of building drawn up like a regiment of dragoons or grenadiers, in which entire symmetry of figure and costume is the great thing studied? On the contrary, in every

building of that character they erected towers and crosses, which threw so much light and shade, that it was hard to say whether you admired the building most at ten miles off, or when you came nearer, and looked at the exquisite taste with which all the subordinate details of the building were brought out.

There is another illustration—Donaldson's Hospital, Edinburgh, erected by my esteemed friend, Mr Playfair, second to none of the architects of his day. But although Donaldson's Hospital is a most beautiful edifice, yet no person who has seen it but must have lamented that, notwithstanding its elaborate details—as is felt when looking at the New Houses of Parliament—there is a want of projections, and a consequent want of light and shade to give effect to the edifice. There is plenty of speciality of beauty, but there is want of generality of effect. If any of you go along the Dean Bridge, on the road to Queensferry, you will obtain a fine view of the hospital, and then this defect no longer appears. Why is this? The answer is plain. At the back of the building there is a chapter-house; that building projects out, and the effect of it is such, that the whole building, from that point of view, is perfectly beautiful, and just because it has that which all Gothic cathedrals have—generality of effect, and broad masses of light and shadow. It has not this advantage in front, which is a uniform line, in which one part is exactly like another, and thence its only defect. At the same time, there is no structure which modern art has erected so honourable to the artist, to the workman, or to Scotland.

I think that those principles which I mentioned apply to every order of Architecture. There is no order of the art in which they will not be found to be true, and in which you must

not combine generality of effect with speciality of beauty. If you look only to generality of effect, you have a naked majestic skeleton like the temple of Neptune at Pæstum, or that of Theseus at Athens. If you look only to speciality, you have an example in the Houses of Parliament, where you have a long line of beautiful pillars without generality of effect. Combine both, and you have the Parthenon on the Acropolis, or the Cathedral of Cologne. The object of the artist should be to combine the general effect of the whole edifice, viewed from a distance, with the most perfect harmony in all its parts, with the utmost minuteness in every part, and without overloading the edifice with such ornaments as, on coming near it, would destroy the charming impression which the view at a distance inspired.

There is one other point to which I wish to direct your attention, and that is the extreme danger of attempting to introduce too great variety in *ornament and detail* in buildings. Uniformity and harmony is there the great secret of success. Compare the exquisite façade of the Louvre, or the Place Louis XV. at Paris, with the gaudy and meretricious fronts in Regent Street, London, and the truth of this will be at once apparent. Our own Exchange here, which has so noble and imposing a portico in front, has only been prevented from being as perfect an edifice as the Madeleine at Paris, or the Glyptothek at Munich, by the unhappy introduction of variety, and a different style in the back, which mars the symmetry of the whole. Repetition of the same form in detail is a most powerful element in the production. It is in the general structure of the edifice that variety and light and shade are requisite. Paradoxical as it may appear, it will be found to be strictly true, that you will often produce more beauty in detail by the multiplication of deformity than by the

division of beauty. The Sphinxes, which have so majestic an effect in the avenues to the Temples at Luxor, are positively monstrous, if seen singly; it is their vast size—structures of one stone—and perfect uniformity, which produce the impression; and that is one of almost unequalled sublimity.

As we all know, there are various orders of Architecture. It would be taking a very limited view of this noble art indeed, to say that any one of these orders was essentially superior to the other, or that we did not require to be grateful to those who have created all the orders; for it is the multiplication of them all that has advanced it to its present great and varied perfection. If we consider the different orders of Architecture, we shall find that they are like the different languages, each having a character and beauties of its own. We have the Greek, the Latin, the French, the Italian, the Spanish, and the English; every one of them has beauties of its own; and it would be as great a mistake to say that Grecian Architecture alone ought to be considered perfect, or that the Gothic should alone be considered as the model of beauty, as it would be to say that the Greek language should alone be used, or, as some say, that the modern authors alone should be read, and the ancient ones thrown aside. In fact, there is a need of all the orders of Architecture, and every day structures are going on in which all the different styles may be called for. For example, we know the different characters and orders of Grecian Architecture. Thomson has characterized them in familiar and beautiful lines—

> 'First, unadorned
> And nobly plain, the manly Doric rose;
> The Ionic next, with decent matron grace,
> Her airy pillar heaved; luxuriant last,
> The rich Corinthian spread her wanton wreath.'

Some of the orders are adapted for one kind of structure, and some for another. For instance, the Doric is peculiarly adapted for structures of a severe character, such as a triumphal arch, or the entrance to a jail, or any structure which is intended to impress the mind severely with feelings of awe—I mean the unadorned Doric. The enriched Doric, such as seen in the Parthenon, is suited to the commemoration of objects of the highest national interest, and to express vehement general emotions, such as of triumph ; it is peculiarly adapted for national monuments ; and we all know that the Parthenon was the national monument of Greece. It is peculiarly adapted for national monuments, because a great degree of ornament can be combined with majestic simplicity of form. There are other structures ; in which the Ionic style is adopted, such, I would say, as music halls, assembly rooms, rotundas, theatres, or anything of that sort, intended for places of amusement, gratification, or incidental interest. I think the Ionic has been adopted with peculiar taste and success in the structure of the hall in which we now stand, and which we owe to the labours of Messrs Clark and Bell, to whom this city is so much indebted. The Corinthian style is adapted to structures, such as palaces or great houses in the country, where the object is to make a display of wealth, magnificence, and importance, and to convey to the spectator strong impressions of the wealth, power, and importance of the owner. For religious edifices no style ever will be so impressive as the majestic Gothic of our own ancestors.

Gentlemen, I wish to impress on the practical gentlemen who hear me the importance of using in private edifices the Palladian style. I told my friend Mr Playfair, thirty years ago, that if he would exhibit one house in Edinburgh in that

character, it would make his fortune, and that he would soon have two or three hundred houses in the same style. I have never seen in Great Britain or north of the Alps this style faithfully exemplified. The only example we have of it is Whitehall, London, and to a certain degree the east front of Holyrood House in Edinburgh; and if any person will look at either of these buildings, he will see enough to convince him of what that style is capable. Its effect is rich and imposing in the highest degree, and it is particularly adapted to houses where there are several storeys, and where the great evil is uniformity of style and extent of roof. Reflect on George Street, Edinburgh, before it was decorated with shops. It might have been the most magnificent street in Europe, as it has size, breadth, stone, and everything else requisite for the most princely structures; but nevertheless with an entire absence of ornament, and a meagre uniformity of style, it was one of the least impressive streets imaginable; and the reason was, that the roof bore such an enormous proportion to the other part of the buildings, and that there was no ornament on the fronts to relieve their painful uniformity. Now, had the Palladian style been adopted, the effect would have been, I venture to say, that George Street would have been by far the most magnificent street in Europe. There is a structure going up to the west of Buchanan Street, in this city, a good deal in this style, but I fear circumstances will not permit it to be carried out in its original purity and richness. I did not think it could have gone so far as it actually has; but, though imperfect, we may hope that this is a commencement of that style of Architecture, and an evidence that the time for the introduction of a taste for the beauties of that style of Architecture has arrived.

But if any man has seen such a style in the perfection exhibited at Venice, where all the buildings are erected on it, you may conceive what the effect of it would be here, where there is so much wealth, and where there is so much stone—it might be one of the most beautiful cities in the world. The Palladian is the true style of architecture to be applied to private buildings.

I have only another point to which I would call attention before concluding,—it is the great danger to be guarded against by attempting to introduce novelty too much in Architecture. I have said before that we owe a great debt of gratitude to those who have founded the different orders of Architecture which now exist. It is hard to say whether people of taste will derive most gratification, or be most elevated, by the contemplation of the Grecian, the Roman, or the mixed style of Architecture. We owe a deep debt of gratitude to the authors of them all, and it is hard to say which of them is most excellent. I am far from saying that all the orders of Architecture are exhausted. I can conceive a time when a new order of Architecture may be created which may rival the others. But I will say, that nothing is so dangerous, or tends more to degrade, fritter away, and ruin modern art, than the attempt to introduce innovations and new styles of Architecture at this time, and with our habits and associations. Since the Grecian Architecture arose—for I consider the Roman Architecture and the Palladian all belonging to the same—since the first order of Architecture was created by the Greeks, there have been only two new styles introduced—the Gothic and Saracenic. The first of these styles was introduced to us by the northern conquerors, who utterly changed the race, the feelings, the habits, the manners, and the most important ideas then

existing—who emerged from the frozen deserts of Scythia, and who overturned the Roman Empire, and changed the masters of the world. The other was imported by that body of conquerors who issued from the deserts of Arabia, and who also brought with them new ideas, new habits, new laws and manners, and who helped to overthrow the Byzantine dominion. They also produced structures of a different style, that have attracted the wonder and the admiration of subsequent ages. Gentlemen, we thus see what a mighty heave must be given to the human mind before a new order of Architecture can be introduced. To the Gothic conquerors we owe the sublimity of the cathedral, and to the Arabic conquerors the variety of the Alhambra. When we thus see the vast influence that is requisite to enable a new order to take root in the human mind, the prodigious changes which must accompany or precede its establishment, can we hope to have a new order of Architecture merely by having a plaster front put up in Regent Street? It is possible that a new order may come in the lapse of time; but it will not arise in modern Europe—it will not find its birthplace in Great Britain. If a new style of Architecture do arise it will come through a wrench in the human mind, similar to that which it received from the conquests of the Goths and Saracens. It may arise in America—it may arise in New Zealand—it may arise in Australia; but I again repeat, it will not arise with us. It will not arise with us till another language arises, and as we shall not have another language than that of Shakspeare and Milton, so we shall not have another order of Architecture than that of York Cathedral and St Paul's. Let us be thankful for what we have. We have got styles of Architecture applicable to every important object of life, and which embrace every imaginable form of beauty.

There is one variety of Architecture which is of great use and great value in the country—I mean that used in the construction of noblemen's or gentlemen's country houses. I need not say there are many beautiful edifices of this description; nor need I tell you of the beauty of Stowe, or of the massive and imposing structure of Blenheim, which speaks alike of the victories of Marlborough and the glories of the reign of Queen Anne. I need not speak to you of the classic beauty of the palace of the Duke of Hamilton, which is mainly owing to the exquisite taste and great accomplishments of its noble possessor. You know perfectly how many beautiful edifices exist in the country; but I think as a general opinion you will agree with me in thinking that, for our climate and habits, the most suitable style is the Elizabethan. If we look to the various structures that have been raised in this style, the beauty of which is almost unparalleled, and most of which we owe to the cultivated taste of my friend Mr Burn; if we consider the convenience of it, we shall see that, for a building which is to exist through successive generations, there is none so suitable as that style which I have mentioned. It has this advantage, that it admits of indefinite increase without alteration of the proportions of the whole. On all these accounts, I should submit to the consideration of the practical gentlemen who hear me, whether the Ionic is not the style best adapted for edifices intended to contain but a single room—whether the style for houses in towns, where there are several stories, is not the Palladian, as evinced at Whitehall, and the Palace of St Mark's, at Venice—whether for public monuments, commemorative of conquests and triumphs, the Doric style, such as is seen in the Brandenburgh Gate at Berlin, and such as is seen in the fragments from the Parthenon on the Calton Hill of Edinburgh, is not the most

suitable, and the most likely to command the admiration of successive times,—whether the Gothic is not the appropriate one for religious structures—and whether for country mansions the Elizabethan should not be preferred?

I have only to say that I feel proud of being permitted to take part this evening in your proceedings, and in being called to address this, the first meeting of the Architectural Institute in Glasgow. However disqualified I may feel myself, I can say with perfect sincerity that I will yield to no man that exists in passionate admiration of Architecture, and in the most enthusiastic sense of its importance in forming a national taste, in elevating the mind, and in improving the habits of the people. I cannot conclude without saying that the opportunity which the kindness of the directors has afforded me in having turned my mind to scenes long since witnessed in early life, and which has thus awakened a train of thoughts and recollections which subsequent times and occupations, and subsequent cares, have gone far to obliterate, has been one of the most unmingled gratification and the greatest enjoyment; and that from the retrospect given of the structures seen at different times, and the emotions which they produced in my mind, I have felt in some degree the feelings which Gray describes as having been awakened in his mind by the distant prospect of Eton College:—

> 'Ye distant spires, ye antique towers,
> That crown the wat'ry glade,
> Where grateful science still adores
> Her Henry's holy shade;
> And ye that from the stately brow
> Of Windsor's height th' expanse below,
> Of grove, of lawn, of mead survey,
> Whose turf, whose shade, whose flowers among
> Wanders the hoary Thames along
> His silver winding way.

'Ah, happy hills! ah, pleasing shade!
Ah, fields beloved in vain,
Where once my careless childhood strayed,
A stranger yet to pain.
I feel the gales that from ye blow,
A momentary bliss bestow,
As waving fresh their gladsome wing
My weary soul they seem to soothe,
And, redolent of joy and youth,
To breathe a second spring.'

GLASGOW, 30*th January* 1851

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No. VIII.

REMARKS

ON THE

ARCHITECTURE OF TOWNS.

BY

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My Lord Provost and Gentlemen,

I must crave your indulgence while I attempt to submit some observations which have occurred to me regarding the Architecture of Towns. The importance of the subject almost deters me from it. I trust, however, the introduction of the question may be the means of drawing the attention of others to it, and of leading to some practical improvements.

The excellence of a town may, I think, be fairly said to consist in these three things:—its beauty, its salubrity as a place of residence, and those domestic arrangements which promote the comfort of its inhabitants.

It may be a useful subject of inquiry to consider briefly wherein consists the beauty of a town.

In answer to this question it will be generally allowed that

in the majority of cases nature has the greatest share. I mean by nature the situation on which the city or town stands, combined with the surrounding scenery. But while this is admitted, it will not be denied that much depends on its buildings; indeed it is astonishing how much the perfection of one of these qualities makes up for the deficiency of the other,—nay, without any pretensions to architectural beauty, and without anything imposing as to situation, it is surprising what a pleasing effect is produced by a judicious arrangement of the buildings.

I daresay I shall be borne out by the testimony of several now present, when I express the agreeable sensation experienced in passing through some of the smaller towns in England,—a sensation produced neither by the architectural display of the buildings, nor by any natural beauties in the situation, but solely by the arrangement of the streets. I have in my eye at present a small town on the borders of Yorkshire, where this pleasing effect is produced entirely by the judicious position of the buildings, the principal street of which may be from 130 to 150 feet wide. On either side of the carriage-way stands a row of trees, and beyond these the footpaths.

Again, I may bring forward the city of Durham as an instance where the beauty of a town is almost wholly derived from the natural advantages of the situation. Standing on an eminence, almost entirely surrounded by the River Wear, the situation is all that can be desired; but with the exception of its noble cathedral and bishop's castle, which are no doubt magnificent exceptions, its buildings are poor, and present no very picturesque appearance from a distance; and still less pleasing is the internal arrangement of the town. The rising ground, on which stands the cathedral, with its wooded banks, and the river washing round the base, produce, from

the beautiful shaded walks on the opposite side of the river, a most sublime effect.

York is another town which might be adduced as deriving much of its beauty from its situation, and its magnificent Minster. The whole has a very picturesque appearance; and although the streets are narrow and confined, they and the houses are kept so clean that a very different sensation is felt in passing through this town than through Durham.

I have already hinted at three things which, in my opinion, promote the beauty of a town, and which I may here enumerate more distinctly—1*st*. The natural situation. 2*d*. The judicious arrangement of the buildings, as to width of streets, and other particulars relative to the general disposition of town structures; and 3*dly*. The architecture of the buildings. The first of these may be said to be beyond the control of the architect. The other two depend upon him, supported no doubt by his employers. Although the situation may not be under his control, much may be done by him, in the proper adaptation of the style of buildings to the situation, and by the arrangement of them, to supply the want of those natural beauties for which certain localities are famed.

Perhaps, without being charged with any undue partiality for my native town, I may safely give Edinburgh as an instance where the three points I have mentioned, as constituting the beauty of a town, abound, on the whole, to a greater extent than in any other town in Britain.

The laying out of an entire town is not an everyday occurrence, at least on this side of the Atlantic; indeed I may say it never happens. It may therefore be considered superfluous to dilate upon such an extensive view of the subject; as any improvement in the architecture of towns must be made to conform to existing circumstances. Still I do not think this should preclude us from noticing the topics

under consideration, as suggestions may be applicable, less or more, in the extension of towns.

The overcrowding with buildings is perhaps the greatest evil in the architecture of towns. This evil is easily accounted for in those which are fortified, and which are still or have been surrounded with walls. During the civil and international wars in our own country, the safety of the inhabitants very much depended on such means of defence. We can easily conceive that in the course of time the space originally included within the walls would become too contracted for the population. It was no easy matter to extend the limits of the town, as this would involve the rebuilding of the walls and fortifications. Hence, some other means would have to be devised for the increasing population. The only resource would be either to increase the number of buildings, or erect additional storeys to those already in existence.

Although the same reason did not exist for the overcrowding of other towns, still, perhaps, the evil may be traced remotely to the same source. We are very much creatures of habit, and we are apt to follow precedents without enquiry; hence other towns might follow the example of those already in existence, although the same cause did not exist.

Edinburgh was from an ancient date a walled city, and it is no matter of surprise that we find it so closely packed with houses. Its situation also presented barriers for its extension. The valley and marshy ground forming the northern boundary of the ancient city long proved an insurmountable obstacle to any extension in that direction.

Crowded as the Old Town of Edinburgh is at present, it was much worse in former times. Several now living may remember when part of the Luckenbooths remained, a row of lofty tenements, extending on the north side the whole length

of St Giles' Cathedral, leaving between it and the present line of houses a narrow street about the width of the Cowgate, and on the other side merely a footpath. This, however, is only one instance of the state of Edinburgh during the last century. We have only to look at the plan of the city by Edgar, dated 1742, to convince ourselves of the mass of houses crowded together in so little space. From the Castle Hill to the Netherbow Port is one dense mass, unbroken by the openings since made, first for the North Bridge, secondly, for the South Bridge, and more recently for Bank Street and George the Fourth's Bridge.

In connection with the subject of this paper, I thought it might be interesting to exhibit in one view the progress of Edinburgh by such maps or views as are still in existence. Through the kindness of my friend Mr W. F. Watson, bookseller,—who is well known, from his indefatigable research, to possess perhaps one of the largest and most curious collections of portraits, engravings, and autograph manuscripts illustrative of British and Foreign history, that is to be found almost anywhere,—I have obtained the use of the old engravings which are this evening exhibited for the illustration of this paper. So far as I have been able to learn, there is no correct map of the city earlier than Edgar's, published in 1742, and bound up with Maitland's History of Edinburgh.

I was very desirous to have found some old maps, shewing the position of the original wall which enclosed the city of Edinburgh. Not having succeeded, I have, from the position of it as described by Maitland, prepared a piece of paper, the application of which to this the latest map of Edinburgh,* will not only shew the position of that old wall,

* Johnston's Plan of Edinburgh and Leith in 1851, from Actual Survey, by Alfred Lancefield, C.E., F.S.A. Scot.

but will also serve to exhibit the then size of the town, contrasted with what it is at present. In the one view we have it as it stood 400 years ago, and in the other we have it as at present.

Mr Watson's engravings, shewn here to-night, are principally by Dutch artists, and consist of curious old views of Edinburgh, which are interesting, although they give a very incorrect idea of the city, even at the period to which they refer. Some of them are on too small a scale to be seen at a distance, but as they are well worthy of a minute inspection, the members may examine them at the close of the meeting.

No. 1 is an original plan engraved in wood, 1577, representing the siege of the Castle, with the besiegers' batteries. This is most valuable for its antiquity, being about 300 years old.

No. 2 is another bird's-eye view of the town about the same date. It was engraved by Kirkwood in 1817; the plate was, however, destroyed by the great fire in the Parliament Square in 1824. This is the original engraving, and in fine preservation.

No. 3 is a view of Edinburgh from St Leonard's Hill, supposed by Mr Daniel Wilson to have been taken about the year 1650. The engraving exhibited is the original by Rombont Van den Hoyen. It does not give a correct view of the town and the surrounding scenery, although more accurate than the former two. A reduced copy has recently been engraved by Mr Dale.

No. 4, the most interesting and most correct of them all is from the bird's-eye view taken by James Gordon, minister of Rothiemay, in the year 1647. It was done by order of the Common Council, and for which he was paid the munificent sum of 500 merks, which would be about £28 sterling. The rare and valuable engraving exhibited is an original, done at Amsterdam by De Witt. In 1817 it was engraved

anew by Kirkwood, but unfortunately the plates were also destroyed by the great fire ; it has not, however, the smaller views which are upon the old engraving.

The original wall commenced at the Wellhouse Tower, on the north side of the Castlehill, running eastward, until nearly opposite the water reservoir. This part of the original wall appears to have been in existence at the time when Gordon's bird's-eye view was taken. The line crossed the ridge of the hill, descending on the south side, a little to the west of the Assembly Hall ; turning eastwards, it ran parallel to the High Street at the distance of about thirty yards, and joined into the Netherbow Port by a slight curve. The Netherbow Port was so called in distinction from the Upper Bow Port, the position of which was at the second turn of the old West Bow. From the Netherbow Port the old wall followed the line of the more recent one, along the west side of Leith Wynd to the Trinity Hospital, and thence to the foot of Halkerston's Wynd, the remaining part of the north side of the town being defended by the North Loch. The charter for building this original wall was granted by James II., and dated the last day of April 1450.

For sometime after the building of the wall, any extension of the town was upwards, in place of horizontal, permission being granted to add two or three storeys to the then existing houses ; some of them were increased to the enormous height of fifteen storeys. By and by, however, the higher classes, disliking such residences, ventured to build villas for themselves in the suburbs, on the banks of the valley in which is now situated the Cowgate. These villas, according to Maitland, were occupied by the nobility and the senators of the courts of justice.

This new town being, however, beyond the protection of the city wall, and great alarm having been excited by the

defeat of the Scottish army at Flodden, another wall was ordered to be built immediately after that disastrous event, about the year 1513. This second wall extended from the south-eastern corner of the Castle Rock to the Netherbow Port, embracing in its course the New Town to which I have alluded. It extended in a straight line from the Castle Rock to a point in the Vennel, nearly opposite Keir Street, where the most perfect part of it still remains. Thence it extended in an easterly direction to Bristo Port, passing through the Greyfriars' Churchyard; continuing in the same direction, it passed along the south side of the College, by Drummond Street, where it is still standing, and, turning northwards at the foot of that street, it skirted the Pleasance and St Mary's Wynd, and joined in with the old wall at the Netherbow Port.

The third and last extension of the wall was that part enclosing George Heriot's Hospital and the Charity Workhouse, which was built in the year 1620. The western portion of this extension still remains entire, forming one side of the Vennel.

As, I daresay, you are all aware, we are indebted to our excellent chairman, the Lord Provost, for this most accurate map of the city of Edinburgh, which he has kindly lent for the present occasion. Through his kindness also I have here the map of a portion of the New Town laid down to a scale of five feet to the mile. It is to be regretted that the arrival of the Ordnance Surveyors in Edinburgh has induced the Messrs Johnston to suspend for the present the completion of this larger map. I have no doubt it would have proved as useful to the profession as it would have been interesting to the public at large. We have, however, obtained a good substitute in the other, which is laid down from the same survey, and equally correct, although to a smaller scale.

We hear a great deal of the insalubrious nature of the

Old Town of Edinburgh ; but, in opposition to this popular feeling, I venture to say that in no town of Britain is there such a mass of buildings, in the same limited space, placed so favourably for a free circulation of air. I do not deny that many of the under storeys of the houses situated in the closes—mere cellars—are totally unfit for the residence of human beings ; and also that a great difficulty exists in promoting cleanly and healthy habits in the occupants of those lofty tenements, six or eight storeys high. While I admit this, it also appears to me that the Old Town of Edinburgh is susceptible of great improvement: the difficulty is, how to set about it. This difficulty arises from the endless number of proprietors whose private interests have to be consulted, and also the danger of impairing the striking effect at present produced by the buildings to the north of the High Street.

I doubt very much the propriety of sweeping away a part of the houses on the north side of the High Street, and forming a horizontal street parallel to it, or rather, as it has been proposed, sloping in an oblique direction. Such a plan is, in my opinion, liable to two objections,—the one is, that it would materially lessen the picturesque effect of the Old Town, and the other is, that the new houses built on either side of such a street would be in some respects worse situated than the old. Owing to the declivity, two storeys at least would be under ground on one side ; while, were a street to be formed, say only thirty feet wide, and level across, the houses on the upper side of it would, at the back, be fully three storeys under the surface.

The plan I would humbly suggest for improving the Old Town is, to thin the houses as you would thin a plantation when the trees become overcrowded, remove the buildings entirely between every alternate close and the neighbouring

one, and rebuild the remaining houses with high gables, preserving as much as possible the characteristic appearance of the Old Town, and avoiding any light-coloured stone in the new buildings. The red hue of the Craigmillar or Grange stone would perhaps harmonize best with the old buildings; or the best of the old stones might be selected for the parts of the houses most prominently in view from Princes Street: of course, I am here speaking of the north side of the High Street.

By this plan there would be, from the back of the front lands alternately, a wide open area and buildings. These buildings would be open on both sides, and well lighted. They would be admirably adapted for workmen's houses, printing-offices, and various other purposes.

The suggestion I have thrown out is not altogether new, as it is somewhat similar to the proposal made some time ago by my friend Mr William Chambers. It would require to be carried out with great judgment and taste, and I have no doubt difficulties might be overcome were parties all made aware of the advantages to be derived from the improvement. For instance, the front property, which is by far the most valuable, would be materially benefited by being opened up behind. Again, the new buildings would be enhanced in value from the change of situation. The proprietors of these two classes of property might compensate the proprietors who have been deprived of their property.

I cannot leave the Old Town without noticing that most interesting work by Mr D. Wilson, entitled 'Memorials 'of Edinburgh in the Olden Time,' illustrated by engravings of numerous relics of Architecture, in regard to many of which these are the only memorials left.

My friend Mr Anderson only this forenoon called my attention to the most ancient historian of Edinburgh—one

very little known, Alexander Aless. He has kindly sent me the following extract from his Annals of the English Bible :—

'Among the most ancient descriptions of Edinburgh, there is one by a genuine benefactor to his country, too much forgotten, and of whom till recently almost nothing was known. We refer to Alexander Aless, much better known on the Continent, and there by the name of Alesius, born in Edinburgh on the 23d April 1500. His father was a substantial burgess of that city. His having been born in a city since so conspicuous both for literature and research, and his having been the first who, from fond recollections in a foreign land, wrote a description of his own romantic town, only renders the neglect the more remarkable. But his having to escape from Dundee to the Continent after the martyrdom of Patrick Hamilton may so far account for this. It is curious enough that this description of Edinburgh is the only fragment written by Aless which has ever been reprinted till within these four years past. This has been done by the Bannatyne Club, and in elegant style, with explanatory notes.

'In the year that Aless was born, or 1500, the population of Edinburgh was about 8000, dwelling in 700 houses or tenements—St Andrews being the great city in those days.'

In returning to the immediate subject of this paper, I shall perhaps best illustrate the hints I intend to throw out by a reference to the New Town of Edinburgh ; not, however, with any intention of criticising the works of others, but merely the better to explain some points which I consider of importance in Town Architecture, both as regards external effect, and the arrangements necessary in rendering our dwellings as healthy as possible.

No one can look upon the plan of the New Town, and contrast it with that of the Old, without observing the mighty improvement which the former evinced. Important as the various extensions of the town to which I have alluded would appear at the time they were effected, they are all surpassed by the formation of the New Town. Considering the age in which it was planned, and the contracted ideas which even the higher classes entertained of what was requisite for a

town residence, judging from the accommodation with which noble families were satisfied, and throwing our minds back to that period, we must come to the conclusion that the conception of such an extent of building, laid out in what would be considered palaces in those days, was a bold and magnificent idea. From the hints which were thrown out at our last meeting here by Mr Robertson,* there are some doubts to whom this merit is due. Granting that the Duke of York, afterwards James VII., had the merit of first throwing out the idea of building a New Town on the spot now occupied by it, and connecting it with the Old Town by means of a bridge, there is no evidence that I can discover that the matter went further than merely throwing out the suggestion.

The merit of carrying out the idea, whoever first suggested it, must be fairly ascribed to the public men of the day. Provost Drummond, the then Lord Provost of the city, has always been understood to have taken a large share in the business. There was, however, one individual who, I have the best of reasons for knowing, was mainly instrumental in carrying forward the project, and removing difficulties—I refer to the well-known Dr Webster, one of the city ministers. So assiduous was he in his duty, that he succeeded in persuading his colleague—a good easy man, my grandfather—to give up, without any compensation, a lease of a house and park on the Multer's Hill, in order that his favourite plan might be carried into execution. For all such services and exertions the Reverend Doctor was rewarded by a testimonial presented to him by the Town Council—I believe, a service of plate.

There can be no doubt that the Architect, whose plan was selected from others given in to the Council, was Mr James

* Notes on early Scottish Architects, by Joseph Robertson, Esq.—*Transactions Architect. Inst. Scot., No. IV.*

Craig, nephew to the Poet Thomson. I am aware that a difference of opinion exists as to the merits of his plan. The formality with which it is laid out—in regular parallelograms—has been called in question; but I doubt very much whether a more picturesque plan would have so fully developed the beautiful prospects we have of the surrounding scenery. The views from Princes Street and Queen Street, although quite opposed to each other, stand unrivalled; but perhaps the peeps we have in passing along George Street, at the opening of each of the transverse streets, surpass either. You have, on the one hand, the Firth of Forth, with the distant hills and wooded foreground,—enhanced, in my opinion, by the smallness of the portions exposed to view, and at the sametime repeated at every succeeding opening. On the other hand, you have glimpses of the Old Town and the Castle bank as you progress westwards. The views from a town are equally important with the architectural effect of the buildings in it, and equally deserving the attention of the Architect. Indeed this may be held as another feature in which the *beauty* of a town consists.

I shall now make a few remarks on the judicious arrangements of the buildings, as constituting an important feature in the beauty of a town,—the providing of suitable sites for public buildings, where they can not only be seen to advantage, but produce a pleasing effect in the general arrangement. No site can be found so advantageous for a public building as when it forms the termination of a long vista, both as to the general effect, and as affording an opportunity of examining the minutiæ of the design; of course other matters must be taken into account, but this may be taken as a general rule. The want of sites for public buildings appears to me one great defect in Craig's plan of the New Town, and, I am sorry to say, in the more modern extensions of it the matter is not

remedied. I expected to have had one of the original engravings of Craig's plan, but have been disappointed. A copy of it is, however, to be found in Mr D. Wilson's 'Memo-' rials of the Olden Time.' In his original plan, besides the Register House, only two sites are provided for public buildings. One of these was, however, appropriated for the private residence of Sir Lawrence Dundas, now the Royal Bank, and the other to St George's Church. We have, therefore, only two public buildings in sites such as I have alluded to,—the Register House and St George's Church. Both of these buildings have been considered objectionable in their Architecture, but producing a good effect from the situations in which they are placed. St Stephen's Church and the Royal Institution may also be referred to as examples; but the one being placed at the bottom of the hill, destroys in a great measure the advantage of the site, and the other suffers partly from the same cause—I mean from being looked down upon from the rising ground on both sides—and partly from being backed by the lofty buildings of the Old Town. I have here an original drawing of Mr Craig's, shewing another plan of the New Town. Some of the features in it are the same as the one adopted. We have the three main longitudinal streets and the two minor ones. St Andrew Square and Charlotte Square are nearly in their present positions. Churches are, however, designed in the centre of these squares. Anothere square is introduced, entitled 'Grand Square,' with a fountain of water in the centre of it. A row of houses designed on the south side of Princes Street condemns the whole plan, from which we are happily saved. Behind these houses, on the site of the Princes Street Gardens, public markets are shewn.

The public buildings of Glasgow are more favourably situated, many of them forming the termini to the vistas of

streets. One reason exists why more sites of this kind have not been found in Edinburgh, which I may endeavour to explain. In Glasgow we find them not only in the vistas of the longitudinal streets, but also in those of the transverse. In Edinburgh its beautiful situation has partly prevented this arrangement in regard to the transverse streets. Who, for instance, in passing along George Street, would have exchanged the exquisite glimpses at every cross street, to which I have already alluded, for the finest public buildings. Hence the transverse streets are foreclosed for this purpose. We have therefore only George Street, Princes Street, and Queen Street. George Street is so terminated at the west end, and a similar site, we have seen, was left at the eastern termination. The termination of Princes Street at the west end was an admirable site for a public building, but unfortunately it is devoted to an ordinary pile of dwelling-houses.

In planning the extensions of the New Town, the principle I am adverting to appears to have been entirely lost sight of. This is partly to be accounted for from the circumstance that it is chiefly in the central part of a town in which public buildings are required; and further, we must bear in mind that since the period when these extensions were laid out, a new class of such buildings has arisen. Formerly an established church or two, an assembly room, and a theatre were almost the only public buildings required. Now we have banking offices vying with palaces, insurance offices, club houses, national galleries, with a host of churches for other denominations besides the establishment, and so on. How, it may be asked, were sites such as I have alluded to, to be found for such a numerous class of public buildings? This question will be partly answered when I come to allude to another defect in town architecture, affecting, however, the salubrity as well as the beauty of a town.

Princes Street is, without exception, the finest street of which we can boast, whether we consider the splendid prospect from it, or the effect produced by it, as it is seen from so many favourable positions. Beautiful as it is, and calling forth the admiration of every stranger, how much would the effect have been heightened, had some attention been paid to its general architecture. This subject has been partially alluded to recently, in a series of papers which have appeared in one of our journals, and I quite agree with the writer of these papers, that the modern erections have tended to injure rather than improve its appearance. The allusion I have already made to the pleasing effects produced by long continuous lines of buildings, is particularly applicable to Princes Street; and I cannot help thinking that had it not been broken into so many detached parts—suppose two of the present divisions thrown into one—the apparent length of the street would have been increased. In connection with this, had these long continuous masses of building been erected to a regular design, we would have had art combining with the superiority of the situation in producing a still more beautiful and harmonious effect. And here allow me to introduce a general remark in regard to another advantage to be obtained by a continued mass of buildings without the interruption of so many cross streets,—by providing for a public building in the centre of such a mass, you not only relieve the architecture of the whole, but you thus furnish a site for such a building. Such, however, would, in my opinion, produce a much better effect were it detached from the adjoining houses, a space being left on each side, such as we find in the club houses in London.

To return one moment to Princes Street. The question may be put, Can anything be done *now* to ameliorate the defects to which I have alluded? I am not prepared to

answer this question, but I do think something might have been done when Princes Street was in its original state in preserving the spirit of the arrangement entered into with the feuars at the erection of the houses. Whatever latitude was given, or perhaps rather taken, in regard to the heights of the houses, they appear to have been built to a regular line. To preserve the same regularity some legal enactment might have been obtained, somewhat to this effect; that in the conversion of dwelling-houses into shops, the fronts of such shops should project a certain distance (say three feet) from the original building; that in obtaining this grant, the proprietor or proprietors should give up the remaining part of the front area, which would be added to the foot-pavement; that in the case of any public building or office not having shops on the street flat, the Dean of Guild should have a discretionary power in permitting such buildings to project the same distance, which projections might be carried to the top.

Such an arrangement would have not only proved a public benefit, by affording a spacious promenade, such as we have opposite the new shops in the eastern division, but it would have added to the value of the property for shops. It is generally found, I believe, that a crowded thoroughfare is not the best for shops; that the goods displayed in the windows are best seen where there is space on the foot-pavement for parties standing without being jostled by the passers on. Such an arrangement as I have here adverted to would have been the gradual working out of an improvement. So long as the property continued in its original state, it would not have come under the act.

The same improvement might have been effected in Queen Street and George Street. In the latter it would have been still more desirable than in the other two, as, in

addition to an irregularity of outline, the street would be narrowed about one-sixth from its original width, were every proprietor extending his buildings forward to the verge of the front areas. George Street is a fine street, and it would be much to be regretted were it contracted in its width. I need scarcely repeat what has been often said before, how much this street would be improved were the statues removed which at present obstruct the thoroughfare.

The next remark I shall make on the Architecture of towns is one affecting their salubrity rather than their appearance. I refer to the plan, almost universal in Edinburgh, of placing the buildings so that the back areas or greens are surrounded on all sides by them. This plan was first adopted by Craig in his original plan of the New Town, and has been rigidly adhered to, with very few exceptions, in all subsequent enlargements of the town. There are several objections to this plan. The first is that it prevents a free circulation of air, considered so conducive to health. Again, light is with difficulty obtained for some of the apartments of corner tenements and the houses adjoining. This remark is especially applicable where the houses are a great depth from back to front, as in the newer parts of the New Town. Hence, to obtain light, the plan of the buildings at the internal angles requires to be notched in, forming dark recesses, in certain situations excluding both air and light, and creating in the lower parts such a continual damp as cannot fail to prove injurious to the health of the inmates in the houses.

To illustrate the remarks I have made, I have here a plan of buildings in the position to which I have alluded.* There are parts in Edinburgh which are even more objectionable, but this is sufficient for my purpose. In certain cases there is

* Illustrative drawings were exhibited, to which reference is here made.

only one opening for access to the Meuse Lane, and that sometimes only an archway through one of the houses. An inspection of these corners will shew whether I am correct, and a single glance at this plan of the town will shew the force of my observation. In Glasgow the streets are differently arranged. In place of the houses being continued along the cross streets, there are merely the walls enclosing the back grounds. The architecture of the elevations is not so perfect in the one case as in the other; still this imperfection may be very much obviated.

If the locality is such as to warrant shops in the neighbourhood, a handsome row of buildings, one storey high, might be introduced along the cross street between the rows of houses fronting the longitudinal streets; or in situations where shops are not suitable, something of this kind * might be adopted to take off the plain appearance of the wall, and also for finishing off the end of the stables with the entrance to the lane. After this plan * was drawn, I observed in Glasgow another mode, which was by erecting a wall in front of the lane, with an entrance on each side; but this piece of wall appeared so evidently to be erected for a deception, while it did not conceal the lane after all, that I think it is much better to avow it to be a stable lane, which it is well known is a necessary appendage to the better class of houses, and make the best of it as such; or the stables next to the street might be formed into shops, and present the appearance shewn on this drawing.* Of course, in the centres of towns the whole area will require to be built round for places of business, but in such cases the objection I have made to the arrangement does not apply.

It may be said in opposition to my plan, that it would in-

* Reference is here again made to illustrative drawings.

volve a loss to the proprietors of ground, from the diminution of feuing frontage, but this would be compensated for by the additional value given to the corner stances. It is well known that by the plan followed in Edinburgh the corner stances are the least valuable ; hence the number which are remaining unbuilt upon. In some cases the proprietor of the ground has been obliged to build upon them himself. Not only are the corner stances injured, but the adjoining ones also suffer.

The suggestion I threw out, that it would be an improvement to have fewer breaks in the longitudinal streets—larger masses of buildings together—would also compensate for any loss of feuing front along the cross street, as the length of front gained on the longitudinal street would almost make up for the other.

The plan to which I have adverted as being so universally adopted in Edinburgh of building those close squares of houses, can be traced, I think, to the manner adopted of feuing ground—by the lineal foot of front, in place of by the superficial contents of the area. In Glasgow and other towns ground is feued at so much the superficial yard ; or, more correctly speaking, it is valued at so much the superficial yard, and either sold out and out at this price, or the value is computed into an annual feu-duty. The mode of feuing by the length of front has led to other evils. The feuar is necessarily induced to restrict the length of front as much as possible, and to add to the depth from back to front ; hence our houses are not so commodious as they might be—there is always a space in the middle of the house deficient in light. Feuing by the superficial area is more equitable for both feuar and superior. By the other mode it frequently occurs that the same price is paid for ground which is only two-thirds of

the depth of another piece. In other words, the proprietor of ground will get no more for ground 150 feet deep than for that which is only 100 feet.

I have to crave your indulgence while I call your attention to another class of streets, where the evil I have alluded to is equally objectionable. I refer to the junction of two streets forming an acute angle. Such are frequently to be met with in towns in which the buildings are continuous round the corner, shutting in the triangular space behind; and insalubrious dwellings are the result.

By placing a public building in such a situation, not only is an excellent site obtained, but the houses in both lines of streets would be improved. So far as I remember we have only one such corner in Edinburgh appropriated to a public building. I refer to the corner at the junction of Bristo Street and Forrest Road.

I am afraid you will think I am dwelling too much on details; but when so much is said at the present time about the healthiness of towns and sanitory measures, I trust you will agree with me that it is of importance that the attention of such a society as this should be directed to such matters; for, allow me to say, that however much the architect may have in his power, he requires to be aided by the non-professional members of this society, more especially where the feuing or laying out of ground is concerned; hence, as I said at the outset, I trust the agitation of the subject will be the means of drawing forth from others valuable suggestions which may lead to some practical improvement.

I have only another remark or two to make on the Architecture of buildings in towns.

I believe it to be a good principle to be followed in street architecture, that a building should as nearly as pos-

sible correspond in its design to the purpose for which it is intended. There is not only propriety in this, but I consider that in this consists one of the true elements of beauty. I may illustrate the idea thus :—you meet with a fine piece of architecture, say a tetrastyle, or it may be a hexastyle façade, the columns embracing two storeys. You immediately conclude this must be some large building—some public building ; but, on further examination, you find this beautiful piece of Architecture to be a cluster of private houses. Further, the internal arrangement of the houses is sometimes injured in order to have the plan to harmonize with the elevation, or the latter is disturbed to suit the interior plan. Were such a piece of Architecture thrown into the centre of a street as a public building, and a suitable style adopted for the private houses, a more pleasing result would be produced.

A continuous colonnade the height of the principal storey is not objectionable, but the very reverse. The eye is not deceived in this. It conveys to the mind the idea of a covered way along the street.

Crescents have always a fine effect when judiciously introduced, or where the peculiar nature of the situation renders them applicable. In regard, however, to crescents, I think it is objectionable to break the line of them by cross streets. The eye is thereby disturbed, and you do not grasp the effect at one glance, from the want of the continuance of the curve. We have examples of both kinds of crescents at the west end of the New Town. The effect produced by Atholl Crescent is much superior to that of Coates Crescent, notwithstanding the defective nature of the Architecture. These crescents, with the pleasure-grounds intervening between them and the public road, have a fine effect in approaching the town

from the west. The crescents at Bath, if I remember correctly, derive much of their effect from the continuous line of the buildings without any break.

I am afraid you will consider that in the course of these remarks I have deviated from the title I gave to the communication ; still I trust these digressions will not be deemed altogether irrelevant to the subject in hand.

EDINBURGH, 12*th February* 1851.

TRANSACTIONS OF THE ARCHITECTURAL INSTITUTE OF SCOTLAND.
SESSION 1850-51.

No. IX.

ON THE ARCHITECTURAL FEATURES OF EDINBURGH.

BY

J. DICK PEDDIE, ESQ., ARCHITECT, F.A.I.S.

[*Read at the Meeting of the Institute in Edinburgh on 12th February* 1851—*The Right Honourable* WILLIAM JOHNSTON *of Kirkhill, Lord Provost of Edinburgh, in the Chair.*]

THE importance of preserving to Edinburgh its full beauty can scarcely be exaggerated. To its beauty, the Scottish capital owes much of its celebrity. It is that which attracts to it thousands of summer tourists and winter residents; and the money spent on its improvement should be looked on even by those who are incompetent to appreciate its moral influence as an excellent commercial investment.

There prevails much interest in the improvement of our city; but while it leads those who feel it to seek a general end, it is not always accompanied with a definite understand-

ing, on their part, of the means by which that end is to be attained. It is earnestly to be desired that that interest should not be thrown away, but that, united to an understanding of the principles to be attended to in improving the city, it should be made productive of useful results.

Edinburgh owes its singular beauty to the great variety and marked character of its natural features—to the singularly happy adaptation to these of the buildings which cover them —to the consequent variety of these buildings—to the individual beauty of many of them—and to the wonderfully expressive combinations presented by its different parts.

It has been common, in late descriptions of Edinburgh, to ascribe its beauty almost entirely to its strongly marked and striking natural features. Nothing, I think, can be more erroneous. There are many cities in Europe not less naturally striking and strongly marked, which utterly fail to present effects equal to those in our city. I may at present point to two, namely Prague and Constantinople.

Prague presents as great an irregularity of surface as Edinburgh, and possesses the additional advantage of a river flowing through it, and its site has thus offered facilities for the production of effects as striking and beautiful as those in our city. But how inferior to ours are the effects actually produced! There is no variety in character of the buildings on its different heights. Assemblages of houses of the same description cover them all, and their monotony is little broken except by a few towers and spires. Of Constantinople the same remark may be made. The same houses clothe the sides of the hills, and the same mosques crown their summits, varied only in their number and dimensions, and in their mode of distribution. And as there is no variety in the character of the mass of buildings in these cities, the character which they do exhibit is not very strongly marked. There are vast assem-

blages of ordinary houses, interesting, indeed, and impressive, because suggestive of human interests and human activities, and deepened in their impressiveness by the vast extent over which they spread; but there is no contrast.

While in these cities the heights are occupied only on one principle of arrangement, and densely clothed with houses to their summits—the goodness or badness of their effect being left entirely to accident—we find here each eminence clothed in a way peculiar to itself, and most happily adapted to its natural conformation. Had Edinburgh been built like these cities, its heights, wherever there was space, would have been densely clothed with dwelling-houses, broken here and there by a spire or tower, the only difference between different heights being such as would have arisen from chance or their own form. Even then, Edinburgh would have possessed much beauty. But as laid out its beauty has been much enhanced. Each height is occupied in a way quite different from the rest—in a way quite suitable to it—and which gives it an expression different from, and far more forcible, than any it could otherwise have had.

So far, then, from concurring in the opinion that the beauty of Edinburgh is derived merely from its natural features, I imagine there are few cities whose effect is to be so much attributed to their mere Architecture. The architectural objects of Edinburgh are in many cases of great beauty. They present themselves in an astonishing variety. We have the broken, picturesque, and tumultuous piles of the Old Town—the long, regular, disciplined line of Princes Street—the baronial castellated buildings of the jails—the classic monuments on the Calton Hill—the bold light arches of the North Bridge—the elaborately ornamental spire of the Scott Monument. Every eminence and place is occupied by buildings peculiar to itself, and admirably adapted to it.

These buildings are of every conceivable character; and—considering that few or none of them have been designed with the view of harmonizing them with the rest, but that each has been set down as best suited the fancy or convenience of those by whom it was erected—it is marvellous how well, on the whole, they are grouped.

The boasted views of Genoa and Naples find their least important elements in the cities themselves—deriving much of their charm from the sky, the bays, and the surrounding landscape. Constantinople is the only city I have seen which presents, within itself, aspects equal in beauty to those of Edinburgh. But even although strictly within the city, these owe their effect as much to other circumstances as to mere Architectural features. The grand mosques, indeed, which crown the summits of the hills, when not too closely examined in detail, are, perhaps, the most noble buildings in outline, and the most admirably adapted to their sites that exist; and in their relation to each other, and to the objects which surround them, it would be difficult to conceive them improved. But these objects are as important elements in the beauty of the views as the mosques, and they can scarcely be considered Architectural. The houses are in general mean, and present no striking beauties either in form or arrangement; and were it not for the harmonious combination of colour which their red and brown tints make with the bright and varied green of the trees, and for the happy mode in which trees are distributed among them, they would be utterly valueless in the prospect. But combined with these woods, and seen spread out as they are on sloping ground, with the blue waters of the Golden Horn at their feet, and the blue sky above, they contribute materially to a scene of unrivalled beauty.

In the views of Edinburgh, however, there is little colour—there are no bright blues, or greens, or warm browns. Their

beauty exists in spite of the absence of all these, and often, too, in spite of haze and smoke. Even in the clearest weather, Edinburgh is comparatively colourless. Its beauty is almost wholly derived from the combinations of the forms and masses of its buildings, which appear in much greater variety of character than in Constantinople or any other city.

The chief beauties of Edinburgh, and those which are most peculiar to it, are derived from the wonderful combinations of ideas presented by its different parts. In what these combinations lie I shall point out, after glancing hurriedly over the principal features of the city.

The most striking feature is the great central ridge occupied by the High Street. It rises gradually from the Queen's Park, and terminates in the bold and precipitous mass of the Castle Rock. The ground around the base of this singular hill is nearly level with the Queen's Park, and forms, on one side, the Princes Street Gardens, and, on the other, the Cowgate and Grassmarket. The hill is, therefore, quite isolated. The ground surrounding it, after continuing to a considerable breadth nearly level, rises and forms on the north, the hill on which George Street and Princes Street stand, and, on the south, that on which stand the College, Lothian Street, Argyle Square, and the Greyfriars' Church. To the south-east and north-east respectively, are Arthur Seat and the Calton Hill, the former bare, wild, and grand, the latter gentler and more undulating, and covered by classic monuments and other buildings. The central ridge above described we find thickly covered on both sides by masses of lofty, irregular, and extremely picturesque building. On the whole, it is, perhaps, as well occupied as it could be; and the general mode of its occupation tends to heighten its natural effect. On the south side, unfortunately, the effect of its happy occupation is

entirely concealed from view; for, on that side, not only the central hill, but the valley at its foot, and the rising ground opposite it, are closely covered by tall houses. The relative levels of the central ridge, of the valley, and of the rising ground on the south, are thus preserved indeed; but this is but negative praise. The natural effect produced by the singular formation of the central ridge should have been heightened.

I cannot speak so admiringly of the mode in which I think the Calton Hill has been treated. On its west side the Calton Hill dips down suddenly, somewhat in the manner of Arthur Seat and the Castle Hill, into a valley or ravine which lies between it and the New Town. The relative positions of the Old Town, the New Town, and the Calton Hill, are naturally such, that effects of the most splendid description might have been obtained had this ravine been kept open. Unfortunately, houses and streets have been so set down, that these effects are altogether lost, and it is difficult to apprehend, without consideration, what has been the nature of the ground.

The extent of the blunder that, in my opinion, has been committed may be most clearly perceived from the North Bridge. We have in view from it the back of the Regent Bridge. Houses of a vast height have been built across the valley between the Calton Hill and the New Town—a gap being left, and arched over, barely sufficient to leave a good carriage-way. The rapid descent of the Calton Hill into the valley is thus concealed. Its height is diminished by the tall houses which run right into it. Instead of being preserved as a splendid isolated mass, it appears but a continuation and terminal development of the hill on which George Street and Princes Street stand. The beauty of this view would have been greatly increased had the descent of the Calton Hill into the valley been, on all

sides, uninterrupted; and if it was necessary to continue a street, on the level of Princes Street, round the side of the hill, it should have been carried across the valley on a line of light arches, through which views would have been obtained of infinite beauty.

The principal remaining features of Edinburgh are those presented by the New Town. The New Town is mainly composed of two distinct and parallel divisions, one of which is comprehended between the terraces of Princes Street and Queen Street, and the other between the terraces of Heriot Row and Fettes Row. These divisions are made up in precisely the same way. Besides the terraces we have named, they are composed of a great central street, viz., George Street in the one case, and Great King Street in the other, and of two smaller intermediate streets, parallel to the terraces and central streets, and they are divided at right angles, and at regular distances, by broad handsome streets. Between these two divisions lies a large space of ornamental garden ground, and their central streets terminate at both ends in gardens. This separation of the New Town into great masses—the large richly wooded and well ordered gardens that divide them—the white and regular terraces that face these gardens—the varieties of elevation at which they stand, and from which they can be viewed, and the vistas of the streets either terminating in masses of building, or in gardens, or in most exquisite glimpses of the open country, and of the blue sea, and hills of Fife beyond, produce effects of singular beauty.

The street in which the spectator stands seldom forms the object to be looked at and admired. Our Street Architecture is, in general, somewhat bald. There is a want of window-dressings, and cornices and other mouldings in it, which would fail to make our New Town impressive, were it so arranged that our views were limited to single streets. Instead of this,

the distant and faint masses of Architecture which appear at the ends of our streets, and across the spaces of garden, whose detail cannot be seen, but whose regularity and extent give them the effect of magnificence, form the great Architectural objects of attraction, and their effect is heightened, and every appearance of tameness still farther destroyed by the mode in which their surfaces are broken up by intervening trees. These greatly heighten the suggestive effect of almost all the views in the New Town.

The principal views in Edinburgh, as I have said, are those in which the opposed and contrasting masses of the Old and New Towns are both present, and in which their opposition and contrast is the principal element of effect. These are the views from the Castle, the Calton Hill, Princes Street, the North Bridge, and the Mound.

The combination and opposition of the two cities leads to the forcible expression of very striking ideas. The spectator standing midway between the opposing points, has, on one side, the rugged range of the High Street climbing up towards the Castle, which boldly terminates it, and throws into the valley beneath a huge shoulder. On the other, he has the terrace of Princes Street, level, regular, and, on the whole, tame. He has thus, as it were, two cities—one on each hand—suggesting states of society and habits of life entirely different. The one gives an idea of crowding and discomfort: a lawless turbulent look of the houses which compose it, suggests an unquiet and unsettled state of society. The other, regular and level, speaks ideas of comfort, security, and high civilization. The effect of the one is continually heightened by the presence of the other. They are entirely opposed in character, and both display themselves completely. They are widely separated in distance too, as if to mark more distinctly the vast difference between the states of society they repre-

sent, and of which they are the fruits. But their opposing and contrasting effect is immensely increased by the gulf between them. It gives intensity to the idea of opposition of habits and interests in the Old and New Towns ; it makes them not only removed from each other, but apparently mutually inaccessible. How important it is, in giving effect to the view, will be at once felt if we conceive it filled up to the level of Princes Street ; or if, when on the North Bridge, we step back so as to lose sight of the bottom of the valley, and thus give it the power of suggesting a greater depth than it really has.

Such are the principal elements of effect in the finest views in Edinburgh. They present themselves in an astonishing variety of aspects, and the contrast between them, though always decided, is constantly varying in its character. The lowest part of the Old Town, where it sinks nearly into the level ground, is opposed by the boldest and grandest of the New. The Calton Hill, with its precipices surmounted by castellated prisons, and crowned by classic monuments, is opposed to the lower parts of the Canongate. The regular line of Princes Street is opposed to the most rugged and lofty parts of the High Street, and to the grand mass of the Castle rock.

The form of the ground partly gives rise to this opposition ; the nature and form of the buildings increase it ; and the numerous spots from which views are obtained, by altering constantly the relative positions of objects, increase it still farther. The effect too is heightened by the length of opposed surface on both sides, and by the mode in which the opposition terminates at both ends.

In some of the finest views in Edinburgh, such as those eastward from the Mound, the Esplanade, and Castle, other elements come into the view which add new ideas and help to constitute a more varied but not less powerfully expres-

sive scene. We have as the first of these, a bold light bridge, spanning the ravine and connecting the opposing and contrasting cities, and its influence on the view we shall afterwards point out. The second is the Calton Hill. It is unlike either the Old or New Town, and in its combination with the other elements of the view is very expressive. The North Bridge seems to have connected the Old and New Towns, and to have broken the spell which held them in their place, and opposition to each other, and that being broken, the parts of the view beyond have assumed a new and entirely different character.

Such being the nature of the chief beauties of Edinburgh, and that on which their effect depends, it is manifest that everything is to be most strongly objected to which would tend to impair the expression of either side of its principal views, or to confound the opposite sides in position, or by filling up the gulf between them.

Unfortunately several glaring offences of both these kinds present themselves. Of the first kind I shall now only mention one or two.

The most striking of these in the Old Town is the Bank of Scotland, whose large square heavy mass advances rudely from the irregular and picturesque face of the Old Town. It is not the flatness of its surface that is so much to be objected to, as its immense bulk and squareness. A flat surface or two is required to give effect to the deeply indented general face of the city, and to the broad deep shadows in which it abounds; and, accordingly, we find that the beauty of the Old Town is much enhanced by the presence of one or two such surfaces. They not only give full effect to the other parts of the view, but are, in themselves, the members which, principally, give the appearance of great loftiness and boldness to the Old Town. Much of the ancient city is composed of a confused

collection of gables, which seem to rise higher and higher as they leave the banks of the ravine. But *they* do not give the effect of precipitous rise. That effect is produced by one or two huge piles standing well forward, and rising at once, without step or degree, sheer up to a great height. But the Bank of Scotland has nothing in common with these. It separates itself from the general mass, as well in situation as in character—intercepts by its projection the view of several parts of the town beyond it, and diminishes in size the objects near it. Besides, it is an ugly object. Any alteration made on it should aim at the diminution of its heaviness. Conformity of character to the neighbouring houses is not to be looked upon as being of very great consequence. But by lightening the mass, and breaking up its dull monotony, its power of crushing objects round it, and of throwing them into insignificance, would be at once taken away.

On the other side, we find several injurious objects, such as the Scott Monument. In some respects it is a very beautiful building, but at present I regard it as associated with objects around it. It stands most awkwardly, I think, in front of the terrace of Princes Street, like a great intruder judged unfit to join in the general rank, and it overpowers the whole street with its immense height, reducing houses, by no means high, into insignificance. I cannot help always feeling, too, that it materially impairs the view by breaking the regularity of the New Town, which is the feature that most contributes to its beauty.

In the views from the Mound also, looking eastward, this monument is felt to be so overpowering in effect, on account both of its own nature and of its nearness to the eye, that the more distant parts of the view, composed of the North Bridge, the Calton Hill, &c.,—which, on account of their distance and faintness, require to be looked at steadily that their beauty

may be fully felt—are apt to be neglected in the forcible demand it makes on the attention. Its dimensions, richness, and strong light and shade, so attract the eye, that we are apt to overlook the more distant and soft, but more varied and suggestive, beauties of the scene.

Another fault on this side I would simply notice. It lies in the vertical character given by their narrowness to some of the later erected houses. The horizontality of the street is that which most gives it its effect of contrast with the Old Town, and it should therefore be most carefully maintained.

The class of objects I have mentioned is not so injurious, however, as those which tend to confound the opposing cities, by approximating them to each other, or by filling up the gulf between them. Of the first kind are the New Buildings on the North Bridge, which shoot out from the New Town towards the Old as if to connect them together. Even more detrimental than these, however, are all objects which tend to fill up the gulf, and to impair the expression of separation between the cities. The grand blot on the views of Edinburgh, from its effect in this way, is the Mound. How it is so will be easily understood from what we have now said. It runs right across the ravine, a heavy dull mass. But for it, the view, magnificent as it is, would have been unspeakably more so. We should have seen along the whole extent of the ravine. We should have seen the Old Town ascending from the valley till it gave place to the lovely bank under the Castle Esplanade, ascending with its steep slope richly wooded and clothed with grass from the bottom of the ravine, until suddenly terminated, and rendered more beautiful by contrast with the bold rock of the Castle itself rising in vast masses, with its finely broken and richly-coloured surface. How beautiful the valley itself might have appeared—how it might have contained

statues, monuments, and fountains, I need not now describe. As it is, we have the Mound—a dark heavy mass—impairing in its force the idea of separation between the Old and New Towns, shutting out from sight some of the finest parts of the scene, injuring thereby the effect of all, and casting even into that part of the valley visible from the spot on which we stand, a gloomy shade. A light bridge would have produced none of these evils; and if it seemed to bring into contact cities so separated in all respects as the Old and New Towns, it would rather have heightened the suggestive power of the whole scene by the ideas it would have raised of difficulties overcome, and relations established between things greatly opposed in nature. And this, accordingly, we find to be the case with the North Bridge. It expresses the depth and impassability of the ravine, and enlarges them to the imagination. It speaks of art and skill triumphing over difficulties, and multiplies and extends the relation of the different members of the view. The Mound destroys the effect of division and opposition between the two cities. It brings them, as it were, into contact, and materially injures the ravine. The North Bridge connects the cities, but in such a way that the opposition between them appears greater than ever, from the apparent vastness of the effort which has been necessary to unite them.

Another evil of the same nature as the Mound, but not of such magnitude, and on which I cannot now dwell, is the Waverley Bridge and Railway Buildings, which fill up the ravine to a great extent.

I have thus very hastily glanced over the principal features of Edinburgh, and the principal elements of its effect, and the principal circumstances which mar its beauty. To preserve its beauty should be an object of the most anxious

solicitude to our citizens. To do so will require no little watchfulness on their part, and no little study on the part of those in whose hands the adornment of the city lies, a study different from that which devolves on their profession in other cities. The features of the ground are much more strongly marked here than in most other cities. The natural members of the view are distinct and strong in character. In level, or comparatively level cities, nature is not to be so much considered in our arrangements. Our groups are there entirely artificial, and therefore much wider scope is given in designing, and designing is rendered simple, because restricted by fewer conditions. In our city it is not so, and we must, if we would succeed in attaining beauty, design everything, not as a member of an *architectural* group only, but of a great natural scene, or rather of many great natural scenes. But if designing is, on this account, rendered more difficult, our attainment of great results with little means is rendered much more easy. Nature has herself supplied the chief elements for great effects, and all that we have to do is to work along with her. We cannot expect to add numerously to the buildings which, by their size and magnificence, would be considered as great ornaments to the city; but we may expect, even with the limited means at our disposal, to produce assemblages of objects without rivals in effect in any city of Europe. If we direct our efforts to erecting great buildings, our small means will place us far behind many other cities; but if, instead of indulging an ambition which cannot be gratified, we aim at the production of striking scenical effects, and of magnificent panoramas, we have all the material means at our disposal. Hundreds of pounds judiciously spent in Edinburgh may produce a beauty of effect which thousands could never produce in London.

Before concluding, I would direct the attention of the Insti-

tute to one of the paintings before them, exhibiting a view of the Calton Hill from the North Bridge.*

In it we have before us the Calton Hill, covered with its monuments, prisons, and schools. Beginning at the east and coming along the side of the hill, we have Burns' Monument, then the High School with its porticoes. We have next the Prison Buildings and the burying-ground with its monuments. Beyond these, and higher on the hill, are the National Monument, Nelson's Monument, Playfair's Monument, the Royal Observatory, Stewart's Monument, and the Old Observatory. The beauties presented by the Calton Hill arise from its own form, from the (in general) happy adaptation to their sites of the buildings upon it, and from the grouping of these buildings. Although in all these respects there is much to admire, in most of them an attentive examination finds defects. Some of these, I shall point out, but I shall not speak of defects in the *design* of the different buildings. Probably a strict examination would find defects in all, since none of them have been designed with an eye to the general effect of the whole view, but each for itself. I shall only take notice of those defects which are to be found in the grouping of the buildings, or in their want of adaptation in character or form to the sites they occupy.

The first obnoxious object I shall mention is the Old Observatory, a shapeless mass, not picturesque, and placed where, if picturesque, it would be almost more objectionable than it now is; for it always groups with two classical buildings, viz., Stewart's Monument and the Royal Observatory. It is objectionable, too, on account of its competing with the Royal Observatory in crowning the summit of the part of the

* Several views in Edinburgh were exhibited to the Meeting by Mr Peddie in illustration of this paper.

hill on which it stands. The Royal Observatory ought to be monarch there, both on account of its position and of its character.

The next objectionable member of the view is the Monument to the Martyrs for Reform. It is a tall thin isolated mass, standing where no such mass should stand, on the brow of a steep rugged cliff. It would be well enough standing on a plain, as in Egypt it would have stood, but it is completely out of place where now situated. The massive swelling natural base which supports it seems as if made to carry a mountain of architecture, instead of a tall thin building such as the obelisk. Any such object must be completely out of place when it rises up suddenly from the side of a swelling mass such as the hill. The latter is itself an object in the view, and its lines and character require to be as much studied as those of the buildings placed upon it, that we may avoid any harsh or abrupt interruption of them. The towers of the prisons, it is true, are as tall as the obelisk, but they are connected with masses of building which prepare the eye for them, or with masses of rock which operate in the same way. Thus, in the case of the prisons, the groups are, on the whole, singularly well adapted to the hill, although presenting some of the features which we find in the obelisk. Another fault of the obelisk arises from its contrast, in character, with the other towers on the hill, namely, those of the prisons and Nelson's Monument. These are all similar in style, and are round and full in effect. But the Reform Monument is a plain hard square mass, totally differing from them both in character and in proportion. The last objection I shall bring against it is, that in this view it interferes with what either are the lowest, or are, by their distance from the eye, made to appear the lowest, buildings on the hill. It intercepts the view of Stewart's Monument, or the

Observatory, or Playfair's Monument, as the spectator changes his position.

The next injurious object is Nelson's Monument. It is so partly on account of its being, although to a less extent than the obelisk, a sudden break in the lines of the hill. Its position on the summit makes it less objectionable on this account than on another site it would have been, and it is to some extent prepared for by the platform of building on which it stands. In itself it is an ugly object, and it is rendered still more ugly and objectionable by its being associated with classical buildings. Again, it has too little breadth for the platform on which it stands. Of the Observatory the same may be said. The platforms of both these buildings are very large and level, and are, besides, the distinct summits of two divisions of the hill. On both these accounts they should have been covered by much larger buildings than those which now occupy them. Their being so covered would have given more variety to the elevation of the hill, whilst the building on the platform of Nelson's Monument, having greatly the advantage of height, would still have distinctly marked its summit. On the site of Nelson's Monument especially, a large building is required, in order to maintain the due pre-eminence of that part of the hill. The shoulders of the hill, on which the prisons stand, are elevated by the turrets and buildings which rise from them, and therefore the centre of the hill requires elevation too. To attain this, and yet to ensure the keeping of the character of the building there placed with the objects which most nearly surround it, is the end to be secured in any new erection upon it. The building here erected must be classical. This I would assume. It must be a lofty and a broad pile to cover the table on which it stands, and it must approach an apex to finish the outline of the hill; and these conditions I apprehend can only be fulfilled by a building of

broad base, and finished with a dome of low elevation compared to most modern ones. In outline, it should, perhaps, most resemble a Turkish mosque. It would be thus assimilated in character to the Observatory.

The alterations and arrangements which I have thus suggested would not, I believe, more than the present state of matters, be injurious to the National Monument.

The site of the National Monument is not altogether satisfactory, and yet it is the only one of area sufficient for the building. The National Monument is concealed from view, and crushed by Nelson's Monument; and even were the latter removed, the former would be only partially seen from the most frequented parts of the city, namely, the North Bridge and Princes Street. From the middle of Princes Street, indeed, the western portico will be seen, although not to the base; but when viewed from the North Bridge the shoulder of the hill on which Nelson's Monument stands cuts across the building about half-way up its columns, and nearly throughout its whole length.

There are other views, however, in which it is completely seen, those, namely, from the north and east, from Arthur Seat, and from the distant south. I have little hesitation in saying that, as seen from these points, it would, when finished, be without an equal in Europe. It is not unusual to hear it remarked of the National Monument, that it is so beautiful in its present state it would be a pity to finish it. Such an opinion can only be founded on ignorance of the intended nature of the building. Those who hold it would be at once converted, could they but see the model on which the National Monument is designed. Ruined as it is, the Parthenon still shows the complete Doric order in one of its porticoes and pediments. The columns are there seen with their complete entablature, giving them the appearance of

having a superincumbent mass suited to their dimensions. The rise of the pediment above them gives full dignity of effect to the building, and the wall behind the columns gives at once the effect of repose, which constitutes the special charm of Greek architecture, and a surface for the complete play of the shadows of the columns, without which their delicacy of shading and their refinement of effect cannot be seen. The ruined Parthenon has a grandeur and majesty which cannot be described.

A National Monument has been erected in Germany after the model of the Parthenon, and it should furnish a better idea to most people of the National Monument of Scotland —we speak of the Walhalla at Regensburg. Unfortunately, it is so situated, and has such additional circumstances connected with it, that its effect is entirely different from that of the original. It stands on the left of the Danube, about six miles below Regensburg, on one of a series of undulating hills. The area of the top of the hill has been insufficient to receive the building without concealing it partly from view in front. An immense mass of masonry has therefore been thrown up on the face of the hill, and the platform of the building laid partly on the top of it. This under mass of masonry is of much greater height than the Walhalla itself, and as it gradually swells out on either side, from the top to the bottom, being considerably broader at the top than the Walhalla, it forms an immense pile of building. From the front it has the appearance of a great pyramid, having steps hewn out in its face, and crowned with a Grecian temple. The temple becomes the smaller part of the mass, less in bulk, and apparently almost an accessory part—a sort of crowning ornament to the pyramid, instead of appearing, as it should do, a complete and perfect building: it is overcome in effect by the under building, and not only looks less important than it, but

absolutely unimportant in itself. In the case of the National Monument we should have no such difficulty to contend with. The monument would have a basement in proportion to its size. It would appear a complete building. Even as it now stands it has much more the effect of great size than the Walhalla. It is more imposing with its twelve columns than the Walhalla in its complete state. Its completion is of great importance to Edinburgh. It would add to the number of our buildings the most beautiful classical one in Europe—a building without rival in ancient times; it would make Edinburgh still more than it now is, a Modern Athens, and more than ever attractive to visitors. Thousands of strangers annually repair to Regensburg to see the Walhalla, and the town is enriched by them. To Edinburgh the completion of the National Monument would be not less advantageous.

Many people think that the Calton Hill is crowded with buildings. There are still many spots on the hill which might be occupied before this can be the case. The effect of crowding, if there be any, is produced by the want of any decided superiority in one or more of the buildings to others.

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No. X.

CITIES AND ARCHITECTS.

BY

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[*Read at the Meeting of the Institute in Glasgow on 27th February* 1851—*The Honourable Sir* JAMES ANDERSON, *Lord Provost of Glasgow, in the Chair.*]

THE object of this paper is to exhibit a brief outline of that field of study to which the modern Architect is called in reference to our towns and cities. We say the modern Architect, not because we believe that the Architects of other generations gave no adequate study to the architectural economics of cities, but because we believe that the vast changes which the pursuits of civilised life have introduced into every department of society, render the labours of the Architect a thousand times more onerous and diversified now than at any former age of the world. And nowhere is this so apparent as amidst the multifarious communities of our towns and cities. For, while the hand of progress is everywhere at work remodelling the very aspect of nature, and smoothing the furrows of her brow with the broad chisel of improve-

ment, there is no direction in which this progress has been so conspicuously developed as in our towns and cities. For there we not only see the record of accomplished change incessantly engraven with the pen of history, but the fainter outline of changes yet to come as incessantly portrayed with the pen of promise. It is within the walls of these epitomes of states that the largest proportion of civilised man have now taken up their residence. It is there that the acquired wants and real necessities of our race expect alike to be gratified. It is there that accommodation requires to be provided for every class of men, be their office, trade, or pursuit what it may; and to suit every species of assembly, whether for religion, commerce, or entertainment. And it is while following the strict walk of his profession that the Architect may be called upon to supply, by his skill, the accommodation best suited for the whole of these diversified requirements.

Nor would it be a just estimate of the legitimate labours of the Architect, if we lost sight of the fact that these labours ought to be as much connected with the city, in its aggregate mass of streets and squares, as in its minuter sections of individual buildings. Because in whatever aspect, or to whatever extent, the material economy of a city is found to affect the principles of beauty or convenience, safety, health, or comfort, in that aspect, and to that extent, the Architect, as the conservator of modern life, is the legitimate authority in design and execution. If such be the influence which Architecture ought to possess, it surely becomes a matter of deep interest to society to see that no undue or irregular interferences are preventing its exercise. The necessity for such watchfulness will be more apparent if we illustrate its importance by a reference to another profession. As, for instance, what would be the result if the graduates of physic were so controlled or neglected that they neither had an opportunity

of exercising the regular duties of their calling, nor exhibiting those improvements with which research and experience have furnished them? Would not the community who followed such a course be speedily convinced that it was not less dishonouring to physic than dangerous to themselves. And so, unquestionably, will the result prove, if Architecture be similarly overridden or neglected. The effects may be less immediate, but they will be far more continued and irremediable. A few months or years may suffice to relieve a community from its gravest errors in divinity, medicine, or law; but centuries may fail to remedy the errors of Architecture. Where is the town that is not at this day suffering from the maltreatment of Architecture in past generations,—maltreatment which the regret and experience of centuries have failed to eradicate. And how disastrous to be forced to add, where is the town which at this very day, from the strange caprice of desiring to be its own architect, or the still stranger caprice of forgetting that there is such a profession as that of Architecture at hand, is not perpetuating monstrosities as injurious and unsightly as the vilest of bygone times.

Such things ought not to be, and such things may not continue to be, without a retribution, whose severity may be estimated from comparatively recent events. And even apart from the severer class of consequences, which must always follow the neglect of just principles of science and art in City Architecture, there is a minor order of evils which men fail to note, though suffering under them. Of some of these we have an illustration in the effects which climate and scenery produce on our bodily and mental constitution. Study the mountaineer, whose home is amidst the storms and grandeur of an alpine range, or the Asiatic, whose vision is bounded by a waste of sand, and you will find that, apart from their condition at the time, they are

unconsciously receiving impressions, whose power will determine no small portion of their future state and character.

Nor is it different with the denizen of a city. Living in the midst of its crowded streets and peculiarized inhabitants, he cannot shut out or obliterate impressions. The features of a city are too large to be innoxious, and the citizen is kept too continually under their influence to escape the consequences. The crooked and sombre thoroughfare, with its miles of tasteless walls, is too great a fact to be overlooked ; and the man whose years are passed in the perambulation of its endless pavements will carry with him to the end the results of the connexion. How important, then, we may be pardoned for reiterating, that the universal authority and intelligence of a nation should be aroused and instructed in reference to sound principles of architectural economy. The whole civilised world may now be said to be either flanked by or shut up within our cities' walls ; and surely in such circumstances it is not too much to expect that the inquiry of legislators should be turned with redoubled anxiety to their future amelioration and improvement. Sanatory Boards and Health of Towns' Associations are very well in their way ; but the comfort of our citizens cannot be maintained by the periodical assaults of the whitening brush, however ingeniously applied. The evil is too deep to be reached by the short arm of a temporary cure, and too growing to be arrested by a partial or intermittent opposition.

But we could scarcely claim for this paper a character of resemblance to its title, if we did not now direct attention to other features of the inquiry. And in the first place, let us say of the Architect himself, that in city practice he is peculiarly necessitated to study dimension and form. Edifices have not only to be built in every position and for every purpose, but in almost every case on sites whose outline and

proportions are sadly inadequate to the requirements of the undertaking: how needful then that the Architect should be a master in the economics of space and form. With stubborn walls of stone or brick surrounding on every side the scene of his intended operations, he speedily finds that it must be by some more scientific contrivance than thrusting his elbow through a neighbour's wall that the necessities of the edifice are to be accommodated. The Architect in a city must be prepared to find, in the form and dimensions of every site, a form and dimensions suitable for his building; and whether he be able to square the circle or not, he must be quite able to square the distorted angles of his intended erection.

In the second place, the Architect who would excel in City Architecture must be thoroughly acquainted with the principles of contrast and combination. Called upon to design a private dwelling, a hotel, a bank, a church, a theatre, a warehouse, a shop, or any other of the multifarious fabrics which city life requires, the Architect will speedily discover, in nine cases out of ten, that the chosen locality has features the most opposite and incongruous. He will soon be satisfied that a stereotyped stock of the most approved editions will fail to adapt themselves to every emergency; and, with the utmost obligations to 'Brummagem,' he will find the most orthodox of her wares in danger of cracking when circumstances require him to squeeze them into sites whose shape may be a beau-ideal triangle or an interesting hexagon.

A decorated pinnacle, however faultless, will lose more than its colour in the society of dusky chimney pots in vigorous action, and an Early English Chapel will appear in but suspicious company if the contrast to its buttresses be a smart array of plate-glass windows or haberdashers' gilding. Such things may not be perpetrated without offending the lowest standards of congruity and taste; and yet the Archi-

tect in a city will find himself constantly in danger of committing solecisms as startling and offensive. But is he therefore to despair? Is he therefore to abandon either the prospect or the effort of so moulding his designs that they shall secure, on the one hand, the full practical object of this erection, and exhibit, on the other, an exterior, improving, and improved by, the neighbouring buildings, be these buildings what they may? Surely not; for we are satisfied that the difficulties which beset the City Architect in the higher walks of the profession ought to present themselves only that they may be overcome. And more than that, we believe that these very obstacles may become the best friends of the industrious and inventive architect. If the great captains of the present century had been satisfied to combat every difficulty with the tactics of the schools, where would have been those brilliant efforts of successful strategy, those masterpieces of attack, defence, and retreat, whose triumphs have crowned their authors with the bays of immortality. Or where would have been that long array of illustrious names, the story of whose perseverance, and the fame of whose inventions are found, like the sunbeam, emblazoning the records of every profession, art, and science on the earth. The schools are never to be despised, but if our professional brethren are only to ascend by the straight stair-case of the schools, they must be satisfied with a landing far short of the summit; and if they are urged to cultivate the glowing pliancy of genius, only that they may become the more ductile to the mint and moulding of the antiquary, we fear that the noble opportunities which the obstacles and requirements of a city force upon our architects will be thrown to the lazy gourmands of Precedent and Orthodoxy, and perish in their jaws.

In the third place, it is of leading importance to our

Architects that they acquire a thorough knowledge of the materials with which their works are to be constructed. Needful at all times as such information is, it is peculiarly so when the Architect has to exercise his ingenuity in the city. The economics of materials will be found to have a reference not only to the strength and durability of his structures, but also to their capacity and convenience.

The comparatively modern adaptation of timber, stucco, glass, and iron, to architectural works, has produced a prominent revolution in every feature of the art. Glass not only bears upon her forehead the ancient torch of light, but lends her beauties to adorn the column, pier, and pannel. Sheltering you overhead with her bright canopy, she at the same moment transports her ready lamp, through the medium of the floor's transparency, to the sunken regions below, and chases old Darkness from her legitimate abode—exhibiting that triumphant economy by which she enlightens two separate floors of the same building with one supply of sunbeams.

Iron, that once fertile agent of war and desolation, has now become, in the forge of science, the carrier and the highway of a world's advancement;—iron, with its capabilities for grace and lightness, or strength and durability;—iron, redeeming space, and creating accommodation, with its arched girders and its tapered pillars; or providing, with its trellised galleries, a three-fold floorage in the one area, as in the great Crystal Palace.

Yes, with iron and glass, for we pause not at present to describe the other materials of our handicraft, with iron and glass in their new appropriations and affinities, the Architect should be able to accomplish the most beneficial revolutions in our modern erections.

In the fourth place, the man who makes City Architecture

his study, will be called upon, by imperative considerations, to acquire that knowledge which will enable him to provide structures whose economy shall be productive of health and comfort.

The defective ventilation and sewerage of almost every city in the kingdom, and the continual crowding of house upon house, and perpetual robbery of space and air, must render the attempt to study City Architecture apart from city health both foolish and criminal. And the very distance which we confess ourselves yet to be from perfection in this vital branch of sanatory knowledge only renders the call to study it more binding and imperative. Such an Institute as this should be the right arm of a sanatory movement, because the Architect must not only be the pioneer, but the finisher of those material changes by which such a movement can alone be successful. Let the enlightened and influential members of our Institute, young as it is, speak out with reiterated firmness on the impending dangers to city health and morals, and the public attention will ultimately be arrested. Let them exhibit a determined opposition to every repetition or renewal of unhealthy buildings and unhealthy drains ; and on the other hand, let them encourage every endeavour to have our towns and cities opened up to the light and air of heaven, and we will not despair of yet seeing our tainted atmospheres blown backward to the marshes, and the pestilence arrested at our gates. Let us only add, that claiming for City Architecture that high position which its preëminence demands, we may be allowed to remind our professional brethren that if we aim at a good degree in this arduous calling, it will only be acquired by resolute devotion. For, to obtain an intimacy with the strength and convertibility of materials, the rules of construction, the principles of taste, the disposal of space, the modelling of forms, the sympathy of contrasts, and the

economy of health and comfort, must require that incessant study which comprises the labour of many lifetimes within the brief compass of only one.

And now we might prudently close this imperfect sketch with an apology for its length and barrenness, were it not that in choosing City Architecture for a subject, it might seem designedly neglectful to avoid some slight allusion to the city of our habitation. Of Glasgow it cannot be said that her progress in Architecture has either been rapid or uniform. Like the varying impulse of the tides, the flow of her improvement has been too often followed by an ebb of retrogression. And however much we may have been accustomed to vex ourselves at a development so fitful, or attempt to account for it, we cannot help thinking that the profession have not been altogether blameless as aiders and abettors. For how are we otherwise to explain, with the examples of our Starks and Adams and Nicholsons and Gillespies so long existing in the midst of us, that the streets of Glasgow (the newest of her streets) should present at this day so slight an appearance of artistic arrangement, and so small an acquaintance with the first requirements of beauty. But we trust the days of architectural acquiescence, indifferentism, or inefficiency have passed away and for ever. We trust that the lever of our Institute will be powerful enough to make the sun of Architecture arise in both hemispheres at once, and exhibit to the East and West a prolonged and growing brightness.

No doubt, if anxious to find out secondary causes for our architectural deficiencies, some extenuation might be discovered in the rapidity with which this city has rushed to greatness. Like the man who, desirous of travelling with the 'morning train,' takes but little time for toilet ornamentation, so Glasgow, in journeying with such railway impetus, has not

had time to wait on her architects. We pretend not to say with what speed our brethren have been accustomed to disengage themselves from their nightcaps, or prepare their pencils, but we know this, that Glasgow has generally, somehow or other, got well on her travels before they were ready, putting us in mind of the Yankee couplet—

> Down East, and sharp, but yet unlucky,
> For sharper still was 'cute Kentucky.

But we believe that neither in Glasgow nor in any other city will the art again be left thus untended, to run its impetuous course. The refined and cultivated taste which so many of our citizens possess, and the interest in Architecture which their connexion with this Institute evinces, are in themselves important guarantees that the impetus on the strength of which we are now advancing will not again be repulsed or retarded. For we believe that we are at this moment on the ascending side of the circle, and that in Glasgow, as elsewhere, there are yearly accumulating evidences that neither the patronage of enlightened citizens, nor the industry of talented architects, will be wanting to accelerate our progress.

And in conclusion, we may be permitted to remind this Institute, that Architecture cannot keep pace with the progress of this extraordinary age without extraordinary exertion. If merchandise be providing us with new wealth ; if trade be saluting us with new necessities ; if the wants of modern life be presenting new demands ; and if art and science be providing us with new inventions and materials, it will certainly be expected, with such powerful handmaids, that Architecture will keep pace with the tide, and shew itself able to ride breast for breast with the discoveries and requirements of the age.

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ON SCOTTISH ARCHITECTURE IN RELATION TO ITS SCENERY.

BY

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[*Read at the Meeting of the Institute in Glasgow on 27th February* 1851—*The Honourable Sir* James Anderson, *Lord Provost of Glasgow, in the Chair.*]

I shall first notice a change which has taken place in the social and domestic habits of the citizens of Glasgow, which is likely to have a most important influence on Pictorial Architecture. Amongst the many benefits conferred by science upon the citizen, not the least is the almost total annihilation of time and space for which the lover sighed, which the invention of steam has produced; by whose magic power, swift as meditation, he is transferred from the care and clamour of the great city to the soothing stillness of the pastoral glen or the mountain lake.

This power to skim the sea and scour the plain has

brought to his threshold the fresh breeze and the cooling waters of the Atlantic,—has united the sea-beaten shore with the Rialto; and Glasgow now rises like another Venice, bright and beautiful, from the bosom of the deep. The book of nature has been opened—the fever of life has been stayed—an angel of gladness, with healing on his wings, has visited him. Familiar as household words are now those forms, erewhile known only to the wandering traveller, or but painted feebly to the imagination,—lakes, rocks, torrents, and all the wonders of the Highland scene.

The great obstacle hitherto to the progress of pure art in the commercial city, is the constant occupation of its inhabitants. The commercial spirit—adventurous, energetic, intellectual, and liberal—is favourable to the furtherance of great and bold undertakings; but that leisure necessary for the cultivation of the taste is wanting. The anxieties of business intrude upon the calm moments out of which spring the fair flowers of art and poetry, and the relaxation of the town residence is generally devoted to social enjoyment, or to dreams of fresh speculation. Hence the monstrosities in our art, which characterize many of our commercial cities, and the deficiency in that power of appreciation, which, more than wealth, is the best encouragement to art. The divine strains of Apollo merit higher reward than the rural pipings of the satyr Pan; but when the rewards are indiscriminate, the god deserts the scene.

But thanks to the immortal Watt, a pleasing change has come over the spirit of our dream. The citizen in his quiet retreat, far from the distractions of business, embosomed among lakes and mountains, has found that repose which the city could not give, and already those tastes and accomplishments, the result of that leisure, have begun to develop themselves,—a growing taste for flowers, ornamental garden-

ing, and scenery, and an increased interest in works of art, producing frequent conversations on the taste, style, and character of the villas daily rising around him, and exciting amongst the wealthy a generous emulation to excel each other in the beauty, taste, and splendour of their mansions.

Already many of our leading citizens have fixed their permanent abodes amid the romantic scenery of our lochs; and the splendid Pictorial Architecture of the Lago Maggiore and the Lago di Como will soon pale their ineffectual fires before the rising glories of the Clyde. Our respected Chairman seeks repose from official care in a tasteful and elegant retreat on the peaceful shores of Dunoon. The morning sunbeam, reflected from the bosom of Lochlomond, rests complacently on the towers and battlements of the Castle of Tillichewan; and the great inventive mechanist of the west, in palatial splendour, far from the resounding din of his hundred hammers, enjoys his *otium cum dignitate* in the groves of Shandon. On either shore of the broad estuary of the Clyde, from the rocky steep of Dumbarton to the majestic cliffs of Arran, where the historian of Europe 'perennial plumes his eagle wing,' rise innumerable villas of varied style and pretensions, encircling our lakes, and glittering through their emerald setting 'like 'orient pearls at random strung.' The classic retreat of McCallum More on the grassy slopes of Roseneath, and the still more baronial seclusion of Ardgowan, in vain seek concealment from the obtrusive glance of numberless villas peeping through the hanging woods of the opposing shore.

But the benefit arising from this change in our social habits is not confined in its results to the country and the coast, but has already produced a reactionary benefit on the city itself, by instilling into the mind a taste and love for the

fresh breeze and the pure light of heaven. A powerful desire has sprung up to enjoy these in the city residence;—hence the extension of her arms to the west, and the expansion of her form into the terrace, the crescent, and the square; and we hope we may have soon to add, the spacious park, away from the haunts of business, its smoke and its bustle. And while the richer citizen thus gratifies his new grown taste, he feels that his poorer fellow-citizen should not be doomed by a hard necessity to breathe the tainted atmosphere of the dark and crowded alley, and a love and a philanthropy have thus been generated which are likely to have the most important results in the social welfare and happiness of the whole community.

That powerful and highly imaginative writer Mr Ruskin views with gloomy apprehension the disastrous effects of railways. I shall quote his words. 'The very quietness of 'nature is withdrawn from us. Thousands who once in their 'prolonged travel were subjected to an influence from the 'silent sky and slumbering fields, now bear along with them 'even there the ceaseless fever of their life; and along the 'iron veins that traverse the frame of the country, beat and 'flow the fiery pulses of its exertion, hotter and faster every 'hour; the country is passed over like a green sea by narrow 'bridges, and we are thrown back in continually closer 'crowds upon the city gates.' If Mr Ruskin would take a few weeks at the 'saut water,' these dire forebodings would soon give way to more pleasing reflections.

The Villa Architecture of our coast, placed in scenery of unrivalled grandeur, must henceforth occupy a most important place in Scotch Pictorial Architecture. And it is much to be regretted that the ruthless vandalism of the speculating mason has already too much been allowed to desecrate these lovely scenes.

The most distinguished of our philosophers who have written on the causes of the sublime and beautiful, although differing in many particulars as to the proximate causes, seem to agree in this, that these emotions are assisted in a powerful degree by the associations which immediately rise in the mind of the beholder, and accompany the impressions made by the objects on the external senses. This quality or power of association, which may be said to exist in *ourselves,* establishes at once the necessity and importance of the cultivation of the moral and intellectual qualities of the mind by all those who aim at excellence in the appreciation of what is great and beautiful in *nature.*

The great power which Architecture possesses to conjure up associations in the mind—as being the abode of man, and the record of past ages, enshrining in its forms the joys, the sorrows, the tales and legends, and the thousand recollections of a nation's history—constitutes its productions one of the most important elements of emotion, and one of the most striking features in any scene of which they form a part.

The high place which Architecture is thus entitled and qualified to assume in the landscape as the nucleus of interest and key of emotion, gives to the consideration of its forms, and their judicious arrangement in the scene, an elevation of character and power of interest scarcely equalled in any other department of art. It is almost superfluous to remark, that in this delightful branch of his profession, the architect should bring to his aid in its cultivation the eye of the painter, the enthusiasm of the poet, and the patriot's love. The most perfect effort of Pictorial Architecture is that which combines the greatest power of association with the most perfect harmony and grandeur of composition. The abstract compositions of the great painters are unrivalled in pictorial beauty, united with the most pleasing architec-

tural forms. If these compositions were embalmed with associations of deep and tender interest—with the tale of love, sorrow, or heroic action—they would be the most perfect exemplifications of perfection in Pictorial Architecture.

In our reflections on the Pictorial and Architectural Beauties of Scottish Scenery, we may consider—

The Peculiarities of Scottish Scenery.
The Present and Past State of its Architecture.
The Scenery and Architecture of other countries.
The Practice of the great Painters, and the lessons to be derived from their example.

And first as to the Scenery. Few countries in such limited extent possess such varied attractions in their scenery as Scotland. Every emotion which stirs the breast may there find its counterpart. The simply rural, the beautiful, the picturesque, the romantic, to the loftiest reaches of the sublime, awake their corresponding emotions in the mind—delight, fear, tenderness, desolation, the burst of rapture, and the thrill of awe. The scenery and the people are characteristic of each other;—the quiet lake in the lap of stern Glencoe typifies the mingled qualities in the Scottish mind; the foaming cataract, now lost in the deep abyss, now struggling forward through opposing rocks, and anon meandering gently through the flowery vale, is characteristic of many of her sons. Such was the indomitable and gentle Leyden. Caledonia and her sons are graphically described by the poet:—

'And here awhile the Muse,
High hovering o'er the broad cerulean scene
Sees Caledonia in romantic view:
Her airy mountains, from the waving main,

Invested with a keen diffusive sky,
Breathing the soul acute; her forests huge,
Incult, robust, and tall, by Nature's hand
Planted of old; her azure lakes between,
Pour'd out extensive, and of watery wealth
Full; winding deep, and green, her fertile vales;
With many a cool translucent brimming flood
Wash'd lovely, from the Tweed, (pure parent stream,)
To where the Northern ocean, in vast whirls,
Boils round the naked melancholy isles
Of farthest Thulé, and th' Atlantic surge
Pours in among the stormy Hebrides.
Nurse of a people in Misfortune's school
Train'd up to hardy deeds; a manly race
Of unsubmitting spirit, wise and brave.'

But this scenery, so interesting in itself, is deeply so to every Scotsman, from the innumerable associations with which it is invested;—the mystery which hangs over its early history, when Fingal fought and Ossian sang—the continued struggle for independence—the incessant feuds of the powerful barons—the highland and border raids—and latterly the struggle for religious liberty, fill every page of her history with scenes of powerful and engrossing interest.

Such is the country, the people, and the associations; let us now examine its Architecture.

At the time of the Union, Scotland might be said to possess a national style of Architecture, which had existed for centuries,—the Castellated, the old Scotch, the Palatial, and the Ecclesiastical. The examples of the Palatial are necessarily limited, and may be considered in their early stages as belonging to the Castellated, with its towers and machicolated parapets. The Ecclesiastical did not reach the Tudor period in Scotland, and therefore exists in greater purity than in England. This is decidedly the most magnificent object to be found in Scottish scenery. For the most part in a state of

ruin, mantled with ivy, stained by time; but whether preserved or mouldering to decay, in the forest or the plain, whether frowning in Saxon strength, or rising graceful and flowery against the blue sky, it is alike full of deep and pregnant interest to the poet, the painter, and the antiquary; combining all the attributes of the picturesque, intricate and mysterious beauty in wild witchery and fairy contrast, broken angles and bold projections, unity of design in the whole, now revealed now interrupted, but all tending to one expression and one emotion—that of reverend love and worship.

These beautiful vestiges, wherever found, are full of wild thoughts and fancies. Their pious and peaceful architects had communings with all nature, and dreamy visions of uncreated forms filling the earth, the sky, and the waters, which were caught and moulded and chiselled in the undying stone. Consecrated to religion, sacred from the touch of the profane, the sanctuary of the oppressed, these wildly mysterious, yet august and beautiful fabrics, impressed with silent awe the rude and unlettered worshippers of that age, and inspire even now, all ruinous as they are, with scarcely less veneration, the accomplished enthusiast, when he gazes on their hallowed and time-worn relics.

These remains, having all the attributes for picturesque and pictorial combination, have generally been placed in scenes appropriate to their destination—in the meadow green by the quiet waters, or in the still solitude of the mantling forest. Our native poets, Scott and Campbell, have assigned to these their appropriate place in the scene:—

Scott,—

> 'On this bold brow a lordly tower,
> In that soft vale a lady's bower,
> On yonder meadow far away,
> The cloisters of an abbey grey.'

Campbell,—

> 'His path shall be where streamy mountains swell
> Their shadowy grandeur o'er the narrow dell,
> Where mouldering piles and forests intervene,
> Mingling with darker tints the living green.'

The modern country church may appropriately be placed in a more elevated situation, and will be more effective if embracing a tower in its composition, as a governing power to subdue and unite the whole of its parts together. The village church, surrounded with picturesque cottages, and fine old trees, with ivy creeping up its buttresses, is one of the most pleasing objects in any scene that can be presented to the sight.

We hail with satisfaction the accession to our Institute of many reverend fathers; and we are already indebted to their zeal for two eloquent contributions. May the spirit which animated William of Wykeham be revived amongst them. Religion in every age has been the handmaid of Architecture. Her greatest efforts have been the result of religious enthusiasm. No sentiment can so highly as the religious form a pure and lofty appreciation of what is beautiful and noble either in nature or in art.

Next to the Ecclesiastical—yet as opposed in character as the falcon to the dove—are the numerous castellated remains strewed in great diversity over Scottish scenery, from the lonely peel tower rising isolated on the heath, to the spacious stronghold of the powerful baron.

Whether rising on grisly pedestal, the guardian of the mountain pass, or reflected in silent grandeur from the bosom of the deep; or more frequently crowning with iron diadem the sea-beat promontory;—possessing in a high degree, in its imposing attitude, simplicity of forms, picturesque power, and grand but varied outline, those qualities, associated with

strength and power, which constitute and produce sublime emotions, and connecting the present with the broad and deep shadows of the past—it is an object of the deepest interest, and is entitled to the highest place in the painter's estimation. Its associations are numerous and important, and contrast strongly with the peacefulness of the present time. It tells of captivity and chains—

> 'The battled tower, the donjon keep,
> The loophole grates, where captives weep;'

of long endurance, bold adventure, and all the pomp and splendour of the days of chivalry, 'when minstrels sang of 'knighthood's gallant deeds and beauty's matchless eye.'

The contempt for the mechanical and industrial arts which Rob Roy felt in more recent times, and which characterized the days of chivalry, was not extended to the more graceful arts of music, poetry, and architecture; hence the high degree of perfection which these sometimes attained in warlike states, springing, in the intervals of peace, like wild flowers and green verdure in the interstices of the rugged rock. Many of these remains shew great beauty of composition, and much tasteful and ingenious ornament. As the feudal system prevailed over almost the whole of Europe, other countries furnish many fine examples, and some of these of great extent. Those on the Rhine are highly picturesque, and of great variety. They abound amid the mountain scenery of Italy, and in the defiles of the Pyrenees, and other mountain ridges, where every inaccessible spot was made a rock of defence, and had its tower of strength. The famed Alhambra, though internally breathing its eastern origin, is in external aspect a superb specimen of castellated composition.

A little further onward in the march of time, enshrined in its green old walls, and allied comparatively to more peaceful

times, we overtake that numerous class of buildings which the illustrations of Mr Billings have revealed, and designated as the good old Scotch, national in name and national in feeling. Its more characteristic features are corbels, turrets, round towers, with conical shaped roofs, domes, pedimented windows, and crow-step gables. This style in the mansion-house may be said to have three aspects; first, when united to the Castellated by way of extension; secondly, standing alone in its earliest and plainest aspect; thirdly, as existing in a higher degree of enrichment as at Winton House. This style of building is eminently adapted for picturesque expression, and is therefore extremely suitable for Scottish scenery. It has much grace in its proportions, and is capable of being moulded into any shape. These qualities confer on it the power of assimilation with the rustic, the picturesque, or the undulating. It is simple, wild, and natural, and for all the purposes of domestic life, as a human habitation, it stands almost unrivalled in any other style.

It follows from this examination that till about the time of the Union a style of Architecture prevailed, and was practised in Scotland, which was picturesque, pleasing, expressive, adapted to the scenery, and characteristic of the people.

In examining the favourite styles of the Italian painters, who painted in the grand style, and whose works were ideal representations or abstractions from nature, and confining our attention to Claude, Poussin, and Sebastian Bourdon, three of the most distinguished, we find that in all situations where the outline is distinct and boldly shewn by strong light and shade, the castellated style has been adopted, and that the result of this choice seems to have had the effect of giving great dignity to their compositions. We find also that Poussin uses in similar situations the Italian mansion-house style, as found in the mountain scenery of Italy, and that this seems

also to be suitable for bold scenery; from which we might infer, that as applied to Scottish scenery, where the scene was grand or romantic, the application of either of these styles would be suitable, according to the character of the associations which would be preferred, or which the scene requires, whether national or classic; and that, probably, as the representative of an ancient family, the castellated mansion would be the most suitable; but where the proprietor was the Rudolph of his race, and an elegant mansion was wanted, with classic decoration, that the Italian style would be most appropriate. These are the styles which the great painters have chosen to place conspicuously before the eye, and they seem to have been guided in their choice by the quality which these styles possess of squareness of form, breadth of effect, and plastic power of arrangement into a boldly picturesque outline.

I think also that the old Scotch, when united with a tower, is eminently adapted for bold scenery; and it has the advantage of being more appropriate for residences of a limited extent than the Castellated, not having so much pretension.

The Architecture which has prevailed in this country since the Union, although perhaps superior in internal comfort, bears no impress, in external aspect, of the taste and genius of the people; without fellowship with the soil—it stands unrelieved by pictorial outline—by light and shadow. The free, the independent and beautiful Architecture which sprang almost indigenous from our soil, and adorned our hills and plains, seems to have withered with our national freedom, and to have given place to a servile and lumpish style, which the deepest tones of the artist in vain attempt to palliate, and which nothing but the clouds of night can divest of its deformity. This decadence in Scottish Architecture—this torpor of the architectural mind—when the mortal eye was shut to the light without, and the soul was dark within—was

not limited to one style, but extended its gangrene to the whole Architecture of the country, ecclesiastical and domestic, and shewed but the more darkly that all was light around it; when mind was struggling with mind, and the heights of every science had been gained, and the fame of Scotsmen had been extended to every clime.

This eclipse has, however, for many years passed away, and darkness has given place to light,—we hope never to return;—and like a giant refreshed from his slumber, the genius of Architecture has arisen with renewed strength and energy. The signs of the times are favourable; the little cloud, no bigger than a man's hand, is in the sky, and our hope is bright for the future.

Although much attention has of late been directed to the general improvement of Rural Architecture, the actual steps taken have been of very limited extent. If, therefore, those having influence and power would extend their protecting mantle and fostering hand to that numerous class of buildings, the result would be a transition of the most exhilarating description. The cottage of the peasant, the hamlet, the farm house, and the village church, are objects of such frequent occurrence, that their neglect will mar the finest scene. How much can be effected by the man of taste at little cost to impart a charm, an air of sentiment, to all these,—congenial to the scene, and appropriate to their destination. The importance of giving character to this numerous class of buildings cannot be too strongly impressed on all those whose influence can be brought to bear upon them: they involve the national taste in an equal, if not greater degree than buildings of more important character. Superstition may erect her trophies to the skies, while an abject servility, and a dark and gloomy vandalism, pervade her people.

To the Architect, I would say, let him fulfil the sacred

mission with which he has been entrusted, with a lively faith and ardent zeal. Poisoned by no mercenary thoughts, let him seek to restore and preserve what is beautiful and venerable in our National Architecture; and to build up with a pure taste, wherever he is employed, forms of beauty and of power worthy of the soil, and of a people high in intellectual achievement; so that his works, while adding by their harmony and intrinsic excellence to the great composition of the divine hand, shall also be objects which, in after years, may be dear and interesting from human associations,—telling of man's hopes and fears,—of his sorrows and his joys,—scenes for the nursery tale or the winter hearth; for romance and interest take up their habitation wherever the dwellings of man are to be found. Let these thoughts fill us with a noble enthusiasm, that our creations may be such as will not be unworthy of our high vocation,—such as will enshrine the events of history in all the charms and fascinations of our art.

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ON THE VENTILATION AND WARMING OF BUILDINGS, AND HEATING OF BATHS, AS PRACTISED BY THE ANCIENTS.

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Grecian Architecture is intimately associated with general history. All civilized nations in modern times have bestowed their admiration upon the perfection to which the Greeks had attained in many sciences and arts. The Romans, following in the steps of the Greeks, still farther advanced in intellectual pursuits, and extended by their conquests the civilization of mankind. The Architecture of the Romans partook of the nature of the people, and embraced a wider range than that of the Greeks. The chasteness, the simplicity, the beauty, the taste, the grandeur, and the nameless charms of Grecian Architecture were not excelled, but the orders were extended. The three orders of the Greeks were in-

creased to five. To the Doric, Ionic, and Corinthian were added the Tuscan and Composite, no doubt to meet the increased wants of the people, and to accommodate the buildings to the differences of climate, and to the domestic comforts and luxuries of the community. That such was the case may be inferred from the remarks of Vitruvius, who states—

'The manner in which we arrange the several parts of private 'houses should be made subservient to our position upon the earth's 'surface, and with the nature of the climate. Egypt should have a 'mode peculiar to itself; Spain another; Pontus a third; and again 'Rome another; and generally, in all countries a building ought to de-'pend upon local circumstances. In some countries the heat of the sun 'is frequently oppressive; in others it is scarcely felt; again in others 'the temperature is a mean between these extremes. It follows that 'the aspect which buildings are made to assume should have a certain 'relation to the position of the country upon the globe, and the climate 'to which it is exposed by its situation. In northern regions houses 'ought to be built with covered courts, and sheltered as much as possi-'ble, and their aspects towards the quarter most exposed to the action 'of the sun. On the other hand, the houses of more southern coun-'tries or hotter climates should have open courts, and the apartments 'made to face the north or north-east, so that in either case the natural 'inconveniences of the climate may be obviated by the judicious dispo-'sition of the houses.'

Such is the opinion of an eminent ancient Roman Architect, and whatever weight may be now attached to his opinions, it shews that more than eighteen centuries ago the subject of adapting buildings to domestic comfort had been carefully considered. Although many of the notions on various points entertained by Vitruvius were fanciful, if not visionary and of a speculative cast, yet throughout his works there is a great deal of acute observation and professional knowledge, which is the more interesting from the circumstance that the moderns are apt to consider the ancients deficient in their knowledge of the sciences, though so highly advanced in the arts. The opinions of Vitruvius are the more valuable to us from the

consideration that he is the only writer upon the science of Architecture whose works have been preserved from antiquity. It is certainly not the least pleasing feature to be found in his writings that he pays a just homage to the Architecture of Greece. In his works the grandeur and chasteness of Grecian and Roman Architecture, in its temples, its theatres, its forums, its basilicas, its public baths, and its private dwellings, are beautifully presented. It may be said with truth that Vitruvius, who flourished about the Augustan age of Rome, displayed a knowledge of Architecture, in proportions, acoustics, and domestic arrangements deserving of the attention of succeeding ages. Of him it has been said, that he evinces in the composition of his work much of the learning of the period.

I propose in this paper to consider, in connection with the public and domestic buildings of the ancients, the views they entertained as respects salubrity, associated with ventilation, as respects warmth and comfort, and as respects cleanliness in connection with baths.

It is to be regretted that the works of the ancients which have been handed down to us on most of these points are deficient in details, and that it is only by searching through the works of different writers that minute information can be gleaned. Vitruvius, whose descriptions of temples and theatres are so ample, is peculiarly scanty in information upon domestic edifices. From the Roman writers upon agriculture much valuable information may be obtained upon the construction and arrangements of country houses, both as respects the 'Villa Urbana,' or country house of pleasure, and the 'Villa Rustica,' or farm-house. Cato (B.C. 140), who was the oldest writer on rural affairs, has left some notices upon the situation and disposition of villas. Varro (B.C. 66) who followed after him, more fully considered the subject, which was

continued by Columella (A.D. 37) and other writers. Descriptions of the villa of Cicero at Tusculum (B.C. 43) and others have been preserved. But Pliny the younger, who lived in the reign of the Emperor Trajan (A.D. 114) has left us an accurate description of his villas of Laurentinum and Tusculum, from which it is shewn that while they possessed all that magnificence which their writers attribute to a Roman country mansion, they were at the sametime designed with the utmost regard to comfort and salubrity. Pliny, while his descriptions convey a much better idea of the 'Villa Urbana' than can be obtained from even the works of Vitruvius, seems to have been well aware that the rules laid down by Vitruvius with respect to beauty and proportions, applied equally to the city and the country, and these rules are evidently carried out in the details, situations, and dispositions of Pliny's villas. Vitruvius, in one chapter of his work, in which the aspects of houses best adapted to convenience and health are considered, remarks that

'The winter eating rooms and baths ought to face the winter 'west, because the use of them requires that they should be light at 'the time of the sun's setting; besides which, the western sun being 'immediately opposite to them, renders their temperature mild at the 'close of the day. The sleeping apartments and libraries should be 'made to front the east, because the morning light is necessary for 'them, and books are better preserved when the air and light are 'received from that quarter. When libraries have a southern or a 'western aspect they admit these winds, which, at the same time that 'they carry with them moths, instil also damp vapours into the books, 'which in process of time cause their decay. The vernal and autumnal 'triclinia (or eating-rooms) should face the east, because the windows 'being turned from the sun's rays, whose heat increases as the sun 'advances towards the west, their temperature is cool at the hours they 'are generally used. The summer triclinia should front the north, 'because having that aspect they will be least exposed to the sun, and 'the temperature of the apartments will be grateful at the same time 'that it is conducive to health. No other aspect possesses equal advan-

'tages, for the sun during the solstice would render the air of all others 'sultry. This aspect is necessary for pinacothecæ (picture galleries), and 'the apartments in which the pursuits of embroidery and painting are 'followed, because the colours used in works of this kind retain their 'brightness longer when exposed to an equable and regular light.'

Such were the opinions of Vitruvius concerning the construction of houses adapted to convenience and health for the climate of Italy, but his observations are so just and so important as regards salubrity and ventilation, that they are adapted for every climate, and as deserving of the consideration of the enlightened of these times as they were adapted for the state of science at the period they were written; indeed it is quite refreshing and delightful to read such opinions, emanating from an artist and author who flourished so many hundred years ago.

But the subject of the mere aspect for different kinds of buildings forms but a very small portion of the labours of this eminent man. We find the same consideration given to the construction of houses for the different ranks of the community—'for those who expose goods for sale, for grana-'ries, for houses of bankers, for those who farm the revenue, 'and the houses of lawyers, and men distinguished by their 'eloquence, which ought to be more elegant and spacious for 'the accommodation of those who resort to them for advice 'and instruction.' He adds, 'the nobles, in whom is vested 'the discharge of the duties of the magistracy, should have 'their houses constructed with splendid vestibules, lofty atria, '(courts) and extensive peristyles (porticos,) with plantations 'and spacious walks, disposed with every attention to mag-'nificence of appearance. Besides which they should have 'libraries upon a scale of grandeur little inferior to that of 'national buildings,' and so on. 'Neither magnificent ves-'tibules, tablina, nor atria, therefore, are necessary in the

'houses of persons of moderate fortune.' The atrium was the entrance-room or court of the house, and the tablinum was a room between the atrium and the inner court.

'If, therefore,' he observes, 'houses are arranged according to these principles, and with attention to those laws of propriety which indicate what is consistent with the different conditions of man, everything that convenience requires and experience suggests will have been accomplished. The nature of the situation wherein it is proposed to build ought to be investigated with the same regard to healthiness as would be necessary in selecting a proper site for a city.'

The same principles will equally apply to houses built in the country. According to Columella the country house or villa should consist of three parts,—the urbana, rustica, and fructuria,—the first the master's house, the second for cattle and servants, and the third for grain and wine and oils. The farm-house, according to the more ancient Roman plans, was always joined to the master's house, or a short way removed from it. In other instances of the villa urbana, the farm buildings were removed at some distance from the dwelling-house. According to the first method the prætorium* or master's part of the house, is connected with the farm-house, and at the farthest end of the latter is a kitchen—a projecting building, having the ox-stalls and stables connected with it on the one side, and wine and oil press cellars on the other, which corresponds with the description of Vitruvius, who, when describing the buildings adapted for the health of the lower animals, remarks that—

'The kitchen should be situated in the warmest part of the court, and the stables for the oxen contiguous to it. The stalls for the oxen should be made to face the hearth and the east, because when oxen are

* Martial (who died A.D. 104) makes use of the word prætorium to express the whole villa, which Vitruvius calls pseudo urbanum.

'constantly exposed to light and heat they become smooth coated. No 'husbandman, however ignorant, will suffer cattle to face any other 'quarter of the heavens than the east. The width of the stables ought 'not to be less than ten, or more than fifteen feet, their length pro-'portioned to the number of yokes, each of which should occupy an 'extent of seventeen feet. The stables should be built in the warmest 'part of the villa distant from the hearth, because when horses are 'stalled near fire they become rough coated. It is likewise expedient 'to have stalls for oxen at a distance from the kitchen in the open air; 'these should be so placed as to front the east, because, if they are led 'there to be fed in winter, when the sky is unclouded, they will improve 'in appearance.' 'The granaries should be above ground, and made to 'front either the north or north-east, in order that the grains may not 'be liable to ferment, but, on the contrary, by exposure to a cold atmo-'sphere, may be preserved a long time.'

From these extracts will be perceived the great attention paid to salubrity and ventilation in the construction of all kinds of buildings by the ancients. The importance of light, it could be shewn from other passages, was deemed of essential importance, both as regards comfort and health. In early times the Romans' windows were mere openings in the walls, but as the people advanced in refinement the windows were made of a transparent stone called 'lapis specularis,' (mica or talc.) The openings were also closed with paper, horn, linen cloth, and lattice work. The use of glass was, however, well known to the Romans, and the baths in the ruins of Pompeii contain a fine example of a glass window. In Pliny's villa glazed windows were used.

In an interesting paper in the Philosophical Transactions upon plates of white glass found in the ruins of Herculaneum, resembling the lapis specularis, which admitted light, but excluded the wind and sun, the use of glass is ascribed amongst the Romans to the period of Claudius, A.D. 54, and it is stated that neither the lapis specularis nor glass windows were used before Seneca's time. From the discoveries, however, made at

Pompeii, it is probable that the Romans were well acquainted with the use of glass several centuries before the Christian era, and it is supposed to have been in use so far back as B.C. 536; but its invention is held to be of a much older date. This may be understood from the fact of the progress this branch of art had made at the destruction of Pompeii, A.D. 79. The Romans were acquainted with the process of staining or colouring glass. Good plate glass was found at the thermæ in Pompeii, slightly ground on one side. From the numerous collection of bottles, glasses, and other utensils which likewise have been found at Pompeii, it appears that the inhabitants were well acquainted with glass manufacture in all its departments.

Vitruvius attaches much importance to proper light in buildings. His words are—'Great attention must be paid 'to render buildings of every description sufficiently light.' 'If beams or lintels,' he remarks, 'or floors, interfere with 'the openings, the light must be received from windows 'made above them:—Above all, it must be observed that 'the windows be placed so that the sky may be seen from 'them, otherwise the apartment will not possess sufficient 'airiness.' In another extract, in noticing the most healthy spot within the limits of the city for a theatre, he states—

'Care should be taken to select the most healthy spot within the 'limits of the city for a theatre, for those who frequent them in com-'pany with their families, engaged by the interest they take in the 'representations, remain in fixed attention, whence it happens that the 'pores of the body are exposed to the effects of the atmosphere, which, 'in the neighbourhood of marshes, or spots otherwise unhealthy, is 'charged with vapours prejudicial to the human frame. This incon-'venience may be avoided if the situation be chosen with care and 'circumspection. It is no less necessary that the theatre be not placed 'with its concave part facing the south, because from its peculiar form 'the sun would heat every part alike, and prevent the circulation of air, 'which, becoming rarefied and heated, causes the evaporation and ex-

'haustion of the corporeal juices. On these accounts unwholesome 'situations must be avoided, and healthy spots carefully selected.'

The importance which was attached to particular aspects for rooms as regarded health and comfort, and the attention paid to ventilation by the ancients, may be known likewise from other writers of antiquity. The description of Pliny's (the Consul) villa at Laurentinum, given by himself, is so beautifully and accurately detailed, that with no great stretch of imagination one might suppose one's self a spectator of it.* Pliny remarks—

'From the middle of this portico you pass into an inward court, 'extremely pleasant, and from thence into a handsome hall, which runs 'out towards the sea; so that when there is a south-west wind, it is 'gently washed with the waves, which spread themselves at the foot of 'it. On every side of the hall there are either folding doors or windows, 'equally large, by which means you have a view from the front and 'the two sides, as it were, of three different seas; from the back 'part you see the middle court, the portico, and area; and by another 'view you look through the portico into the porch, from whence the 'prospect is terminated by the woods and mountains which are seen at 'a distance. On the left hand of the hall, something farther from the 'sea, lies a large drawing-room; and beyond that, a second, of a smaller 'size, which has one window to the rising, and another to the setting 'sun. This has likewise a prospect of the sea, but being at a greater 'distance, is less incommoded by it. The angle which the projections

* Pliny was considered an excellent judge of the polite arts of his time. Mustius is the name of the architect that was sometimes employed by Pliny; but whether he designed Pliny's villas is uncertain. Pliny had the opportunity of seeing the works of Apollodorus, one of the greatest architects of his times; but whether he was employed by Pliny is not recorded. Castell, in his Villas of the Ancients (1728), has discussed these points.

Castell, in his ingenious and very interesting work, gives an imaginary sketch of this villa; and Scamozzi, in his Arch. Univer., also gives plans and an elevation of it. Mon. Falibieri has also annexed a plan to the Translation of his Letters. The description of the villas of Varro and Columella, by Castell, throws much light on rural villas. The sketch given by Vicenzo Scamozzi, in his valuable work, published at Venice more than two centuries ago, seems to me to realize the description of Pliny.

'of the hall forms with this drawing-room retains and increases the 'warmth of the sun, and hither my family retreat in winter to perform 'their exercises. It is sheltered from all winds except those which are 'generally attended with clouds, so that nothing can render this place 'useless but what at the same time destroys the fair weather. Con- 'tiguous to this is a room forming the segment of a circle, the windows 'of which are so placed as to receive the sun the whole day; in the 'walls are contrived cases, which contain a collection of books of 'authors whose works can never be read too often,' &c.

In another passage, when describing his villa, he remarks —'To these advantages I must not forget to add, that 'by 'setting open the windows the western breezes have a free 'draught, and by that means the enclosed air is prevented 'from stagnating.'

That the Romans considered breathing healthy air as a matter of paramount importance in regard to human life, is shewn by many of their writers. Varro, in his 'De Re Rustica,' states—'That the skill of the Architect may in a great measure 'guard against bad air, though it is impossible by any art to 'cure the bad air of an ill chosen situation;' and he put great weight upon the apertures of a house, telling us how several cities in Greece were preserved by Hippocrates during a pestilence, and great cures done by Varro himself at Corcyra, by no other knowledge than that of rightly disposing the apertures of a house. Rutilius Palladius (a Roman who wrote twelve books on husbandry, and who lived after Pliny), in his work 'De Re Rustica,' states that the good qualities for a villa consist in salutary air, plenty of wholesome water, a fruitful soil, and a commodious place, and he gives very distinct directions how to judge of the goodness of air and water. All their writers agree that the air next to a marshy soil is remarkably bad, and ought to be carefully avoided. Probably, the fatal effects of the miasma arising from the Pontine Marshes at Rome had a powerful influence upon all

their opinions. Vitruvius had some fanciful notions upon unhealthiness of situation. He supposes accidental insalubrity to proceed from the sun or wind, and has given many rules to guard against the inconvenience, and receive the benefits of both. He states that the animalculæ that are engendered by heat in stagnant waters, being drawn in by the breath together with the air, were esteemed the cause of many distempers. Vitruvius places great reliance, as regards health of cities, in shutting out inclement winds, which he directs should be excluded from streets, and gives a remarkable instance of the bad effects of winds at Mitylene, where, through the founders' ignorance, when the south wind blew it carried sickness and great heat. When Corus (which proceeds from the points between N.N.W. and N.W. by N., and is at Mitylene a moist wind) blew, the inhabitants were troubled with coughs; and when the north wind blew, they recovered their former health,—but then it was so cold that they could not bear staying long in the streets. And he also, a little further on, tells us that the shutting out such winds from a city not only preserved the health of sound persons, but even cured those affected with distempers from other causes, which in other places required the help of medicine. He shews a method of placing a city so that no opening should be exactly opposite to any of its twenty-four points of the wind. Columella and Palladius were beholden to Vitruvius for most of what they wrote on this subject; and as it may be supposed that his works gave laws to the Roman Architects after him, it will be found that those who designed Pliny's villa observed his rules to a great extent.

The attention paid to air and light as respects salubrity being so clearly proved from the writings of the ancients, and it having been shewn that these arrangements were incorporated with their buildings, it is not necessary to follow this

subject farther. Were it necessary to do so, it could be shewn that many mechanical contrivances used in present times for ventilation were known to the ancients. They made use of the vannus or fan, which is mentioned by Virgil as the 'Mystica vannus Iacchi.' Homer also mentions the use of a fan—

> 'While the broad fan with force is whirl'd around.'

This is supposed to have been the ventilabrum or vallus mentioned by Varro and Columella, and is supposed to have been a kind of shovel. However, the wind-fan was in common use in oriental countries from the earliest periods, and its use for many purposes must have been well known to the Romans. It is doubtful if they made use of the ancient Egyptian mode of ventilating their houses by means of the mulguf, which was a wind conductor placed on the roofs of their houses, acting like a wind sail, opening to the prevailing winds; and the framing being sloped downwards, it conveyed the wind below.

Having now shewn the attention which was paid to air and light, as respects salubrity, I will now proceed shortly to shew that the same attention which these writers paid to the mode of adapting buildings to various climates, and to the aspects of these buildings as best adapted to convenience and health, induced them to pay the same regard to those domestic details which were requisite to bring out these results. In a warm climate like Italy, the use of methods for raising the temperature of apartments by artificial means was required only for a small portion of the year; but even this was not neglected in the construction of their houses, nor was the heating process left to mere chance, for we find it was carefully incorporated with the construction of the building. But the Romans were not constructors of houses merely for their own country. As the pioneers of modern civilization,

their conquests extended by the valour of their arms throughout Europe, and they had to encounter cold climates as well as more temperate ones; to bear the cold and humid climate of Britain, as well as the purer atmosphere and milder climate of Italy and Gaul. From every account handed down to us it does not appear that their modes of warming their dwellings underwent much change, at least the remains of the heating chambers or hypocausts found in Britain are much the same as those described by Roman authors.

It is well known that the ancients did not construct their houses like the moderns with chimneys in the walls, which are supposed to have been first introduced into England in the 11th or 12th century. Palladio,* (sometimes mistaken for Palladius, the Roman writer on husbandry), a modern Roman Architect, who flourished early in the 16th century, describes the chimney as common in his time; and that they were in general use in Italy, especially in Venice, in the 12th or 13th century there seems little doubt. Palladio, who tells us that he made the works of Vitruvius his study, and who has thrown much light upon the customs of the ancient Romans, states, that the ancient Roman practice was to have the 'chimney in the middle of the 'room or kitchen, upon which was the funnel of the chim-'ney in a pyramidal form to carry away the smoke, and that 'one of this kind of chimneys was still to be seen near the 'fish-pond of Nero.' He also mentions that in other ancient buildings were found ventiducts for admitting more or less cold air into the rooms, and 'when the ancients did not care to 'have any chimney, they used to make pipes and funnels in 'the thickness of the wall, through which ascended the smoke 'of the fire which was kept under the rooms, and so was 'conveyed through certain vents or valves that were at the 'top of the said pipes or funnels.' The latter plan obviously

* Andrea Palladio was born at Vicenza, 36 miles N.W. of Venice, in 1518, and died in 1580.

refers to the hypocaustum. But there is no doubt that the ancient and general plan of warming their houses made use of by the Romans was that of having portable furnaces or braziers, which were placed in the middle of the room, and carried from room to room as required. The funnel referred to by Palladio most probably was used only for special apartments, as the kitchen, which their writers upon rural affairs seem to have deemed of great importance in the Villa Rustica, and the old custom which was in use in this country of having the fire in the middle of the kitchen, and the open chimney over it, is obviously transmitted from the Romans, and is of great antiquity. That the houses of the Romans suffered from smoke by this method of warming appears from the fact that the images in the hall were called Fumosæ, and the month of December Fumosus. Hence they took great trouble to obtain fuel which emitted little smoke, and made use of wood anointed with the lees of oil (amurca.) The braziers used both by the Greeks and Romans were often of an elegant description; tripods of various forms, with emblematical figures, upheld the pan or dish in which the fire burned, while in a vase below were placed agreeable perfumes of various kinds, doubtless made use of from the mistaken idea that they would counteract the injurious vapours (carbonic acid gas) arising from the burning charcoal.

In the ruins of Pompeii several fine braziers have been found. One discovered in the tepidarium (Plate V., fig. 3), was 7 feet long and 2 feet 6 inches broad. It was made entirely of bronze, excepting an inner lining of iron. The front legs of it were winged sphinxes resting on lion's paws. Another brazier found had hollow walls to contain water. Other stoves, like the present charcoal stoves, have been brought to light. Notwithstanding its insalubrity this rude mode of heating rooms with braziers or dishes of burning charcoal is still used in Italy, Spain, and other places.

In houses of the larger description, and those of the wealthy, plans of warming were adopted, which were combined with the structure of the building itself, and which avoided the noxious exhalations arising from the fuel of the brazier. That different methods of heating were known is fully established by the Roman writers. Beside the more common and more ancient method of heating with the hypocaust both their houses and baths, it is almost certain that they applied, in later periods of the Roman history, the brass tube called by Seneca 'Draco,' for warming the water in the Piscina of their Thermæ, and likewise to heating their buildings. Such also appears to have been the opinion of Palladio. It is not improbable that this plan of heating water was introduced in order to warm large ponds or swimming baths of hot water. Seneca says, N. Q., lib. 3, cap. 24, 'Facere solemus dracones et 'miliaria* et complures formas, in quibus æri tenui fistulas 'struimus, per declive circumdatas: ut, sæpe eundem ignem 'ambiens aqua per tantum fluat spatii, quantum efficiendo 'calori sat est. Frigida itaque intrat, effluit calida.'† This method of heating will afterwards be described; but the more common plan of heating large houses was by means of the hypocaustum or heating chamber, placed in the ground-floor of the building, having flues heated somewhat similar to the plan by which hot-house flues are heated, and

* The miliarium is understood to have been a leaden vessel of considerable circumference, the middle part of which was open for the winding pipe, and for the draught of the fire to pass through. The vessel of water which surrounded the flame was also placed upon part of the same fire, and, for security, the bottom of it was made of brass, as were also the pipes—See Plate V, fig. 2.

† This passage may be thus translated,—We are wont to make dracones and miliaria of many forms, within which we place pipes made of thin brass coiled downwards, many times surrounding the same fire, in which the water flows through as much space as is sufficient to make it hot. It therefore enters cold, and flows out hot.

sometimes pipes or channels in the walls were made to carry the heat to different parts of the building. The fire which heated the furnace was generally placed without the house.

Pliny, in the description of his villa at Laurentinum, states, when mentioning the library, 'From hence you pass 'into a bed-chamber, through a passage, which being boarded 'and suspended as it were over a stove which runs under-'neath, tempers the heat which it receives, and conveys it 'to all parts of the house.' In another passage he mentions, 'Adjoining to this is a bed-chamber, which neither 'the voice of the servants, the murmur of the sea, nor even 'the waving of a tempest can reach; not lightning nor the 'day itself can penetrate it, unless you open the windows. 'This profound tranquillity is occasioned by a passage, which 'divides the wall of this chamber from that of the garden; 'and thus by means of that void intervening space, every 'noise is drowned. Annexed to this, is a small stove-room, 'which, by opening a little window, warms the bed-chamber 'to the degree of heat required.' In the description given by the same author of his villa at Tuscany, the same minuteness of detail is shewn. The house he mentions was situated at a great distance from the sea under one of the Appenine mountains. 'The winters are severe and cold, so that myrtles, 'olives, and trees of that kind, which delight in constant 'warmth, will not flourish here.' Artificial heat in such a situation must be requisite; and accordingly we find him observing, in reference to the want of the sun, as in a cloudy day, that the heat of an adjoining stove very well supplies his place.

These passages very distinctly shew the attention paid to the arrangements of heating, necessary in winter for salubrity and comfort. In the former extract referring to Laurentinum, an old writer upon Pliny's villas remarks:—

'To remedy the inconvenience that must have attended the bed-
'room in winter being placed in such a cold corner of the building, adjoin-
'ing to it was what he calls 'transitus,' or a passage, by means of which
'he heated the rooms. The reason why he had not an hypocaustum under
'this room, as under some others, may probably be, because in these
'the person that was in the room could best judge whether the heat
'was too strong or not, and accordingly let the air or heat come in as
'was requisite; but this being a bed-chamber, and for sleep, it was
'easy for a servant that was without to let in whatever heat might be
'required, which he could be a judge of in this passage, and either mo-
'derate or increase it at pleasure, without disturbing the person that
'was asleep. The use of this dormitorium being only for sleep, there is
'no notice taken either of the sun, air, or prospect.'

This kind of stove so much used was termed a hypocaust (in the Latin hypocaustum), and the chamber or arrangement of flues was also called hypocaust. The mouth of the furnace was termed by the Romans præfurnium, by the Greeks propnigeon, and was used to heat the stove which warmed the apartments above, or the caldarium, or hot water boiler for the bath, as it might be designed.

Some writers consider that the part of the furnace which Vitruvius calls the præfurnium of the Roman baths, and the Greeks called propnigeon, was a room in the Thermæ immediately next the mouth of the furnace, and designed for the same use as the transitus next the dormitorium of the villa, namely, to receive and temper the heat before it was admitted to the sweating-rooms.

The hypocausts were constructed in a simple or more complex form, but in both the flues were generally horizontal, and ran under the floor, as noticed by Pliny, heated from the furnace outside. In the more perfect and costly contrivance of the hypocaust, a complete sunk chamber of large dimensions was formed under the building, the ceiling of which, made of bricks or tiles, was supported by small square and circular pillars, and from this chamber small branch flues were led off horizontally, terminating vertically or other-

wise as required, and conveyed the heat to different parts of the building. Although these hypocausts were made horizontal, having no vertical chimney to maintain combustion leading directly from them, yet in the description given by Vitruvius of several parts of a bath, the advantage of an ascending flue to carry off the smoke seems to have been both appreciated and understood, for he remarks :—

> 'The insulated stages of the caldaria (hot bath) are thus construct-
> 'ed: The floor is made inclining towards the furnace, so that if a ball
> 'were placed upon any part of it, it would not remain at rest, but take a
> 'direction towards the mouth, by which means the flame will more
> 'easily pervade the interval between the floor, which is paved with tiles
> 'a foot and a half square, and the suspended stage. Upon the floor
> 'earthen props, eight inches each way, are arranged at such intervals
> 'as to receive upon them square tiles two feet in length; the props are
> 'two feet in height; the tiles which form them are cemented with clay
> 'and hair mixed together; the square tiles which they support form
> 'the substratum of the pavement of the caldaria.'

The general plan of the hypocaustum was to have the chamber horizontal, with the præfurnium or fire hearth on a little lower level than the floor of the chamber; the furnace was made large for the combustion of the fuel, in order to induce a current into the flues, and was probably supplied with fuel from the outside of the building. Such a construction for heating was chiefly applicable for burning wood, as the smoke from coal would soon have choked up the flues with soot.

In the Philosophical Transactions of London there are some interesting accounts of Roman hypocausts found in England. There is the description of a sudatory or hypocaust found (anno 1701) at Wroxeter in Shropshire, which was one of the most considerable of the military stations of the Romans in Britain. It was supposed to have been a sudatory or sweating-house for Roman soldiers. It was built with four rows of small brick pillars, 8 inches square, and laid in a strong sort of very fine red clay; each pillar was founded upon a foot square tile,

and upon the head of every pillar was a large tile two feet square, hard almost as flint, as most of the Roman bricks are. These pillars were to support a double floor made of very strong mortar, mixed with coarse gravel or bruised bricks. The first of these floors was laid upon the large tiles or quarries, and when dry the second floor was laid upon it. There was a range of tunnel bricks fixed with iron cramps up to the wall within, and their lower ends level with the under sides of the broad bricks, and their upper ends with the surface of the upper floor, and every tunnel had alike two opposite mortised holes, one on either side, cut through for a cross passage to disperse the heat amongst them all. The sketch annexed, Plate III, will give an idea of the plan :—

Fig. 1. A B C D. Ground plat on which the pillars stand.

2. E F. One of the bricks—24 in number.

3. G H I K. Ceiling of square tiles, which lie on the heads of the square pillars.

4. L M N O P Q. Is the sweating-house in perspective, shewing in part the floors and pillars as they were placed.

5. R S T U. Double floor, whose upper surface lies even with the tops of the flues in the perspective sketch.

6. W X. One of the flues or tunnel bricks.

In the Philosophical Transactions an account is given of the discovery of many other hypocausts of the ancients in Britain. Sir C. Wren discovered the remains of one at Winchester. Mr C. Hunter thus describes the remains of one dug up in Yorkshire, near the village of Æbchester in 1702 :—' A square room, strongly vaulted above, was ' found, paved with large square stones set in lime. Under ' this room was a lower room, the roof of which, blackened ' with smoke, was supported by rows of square pillars about ' 18 inches high. The upper rooms had two niches like chim- ' neys in each side of every corner, which, in all, made the

'number 16.' It may be easily understood that the lower room was the hypocaust which heated the upper one. The latter appears to have been a laconicum, where a dry heat was used, and the niches were the sweating places.

Another hypocaust was found in Caernarvonshire; and a third is mentioned by Camden in his Britannia, discovered at Hope, in Flintshire. These hypocausts, found in Britain, according to the opinion of antiquarians, were of two sorts —the one was called Vaporarium, and the other Laconicum or Sudatio, which was a large sweating-bath, in which were the Tria vasa ahena (or cauldrons), called caldarium, tepidarium, and frigidarium, from the water contained in them. This plan has been described by Vitruvius. The other sort of hypocaust is not so distinctly treated by antiquarians. It was a sort of fornax or kiln to heat their small winter parlours or cœnatiuncula, 'sub qua ignis accen-'debatur, unde et cœnatio hypocaustum.'* Cœnationes æstivæ and hybernæ (the summer and winter parlours) are mentioned by Cicero in Epistolis. This hypocaustum was called alveus and fornax. The tubuli seem to have been contrived to convey away the smoke that otherwise would choke the stoker. From the furnace, flues or tubuli were constructed under the floor and in the walls, by which the heat was communicated to several rooms in a house. This kind of stove† has been described by P. Statius (A.D. 96), and is evidently the same as the one alluded to by Pliny in the transitus.

There is also in the Philosophical Transactions a very interesting account of a hypocaustum and sweating-room discovered under ground at Lincoln, anno 1739. Some labourers in digging a cellar in an outhouse fronting the west end of the Minster,

* Which may be translated, 'under which the fire was kindled, from whence also the same cœnatio or parlour was called hypocaustum.'

† It has been conceived that the word stove is derived from Æstus quasi Æstuvium.

PLATE III.

PLAN OF THE HYPOCAUSTUM OR ROMAN SUDATORY

found at Wroxeter in Shropshire 1701.

Fig. 5.

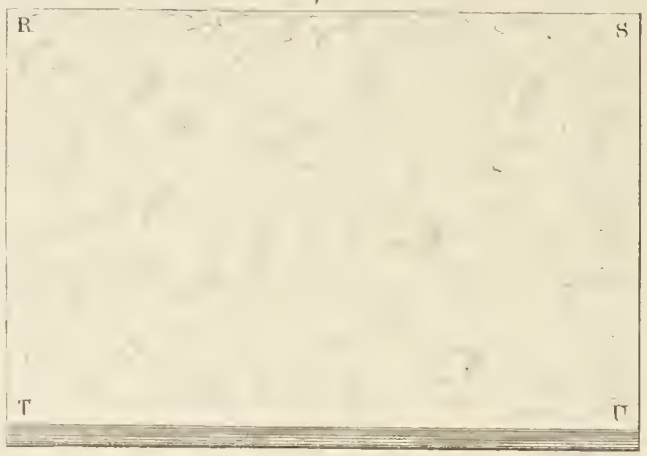


Fig. 3.

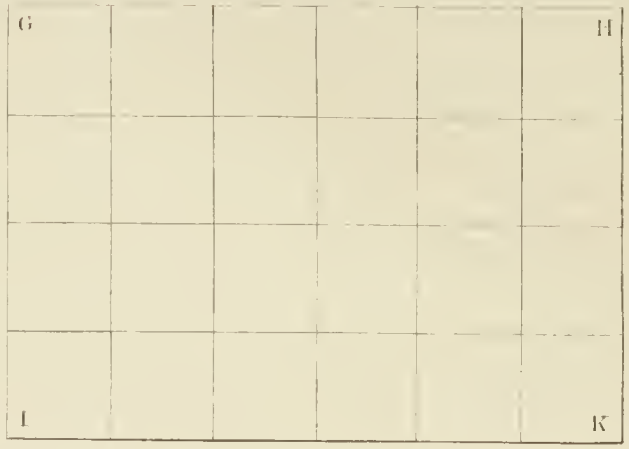
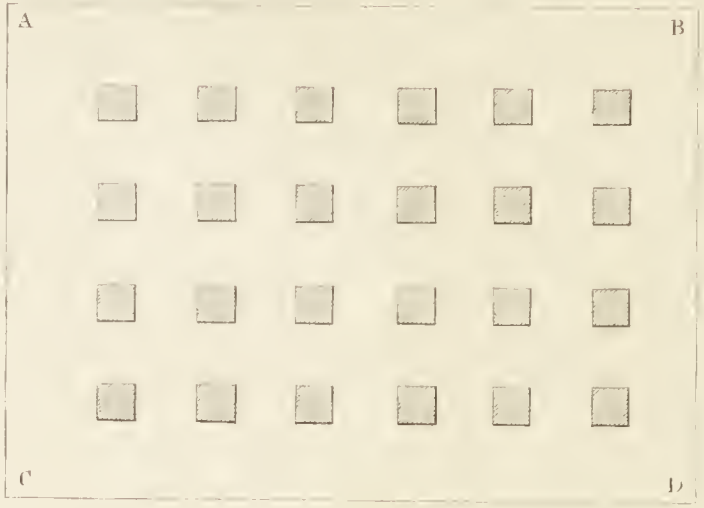


Fig. 2.

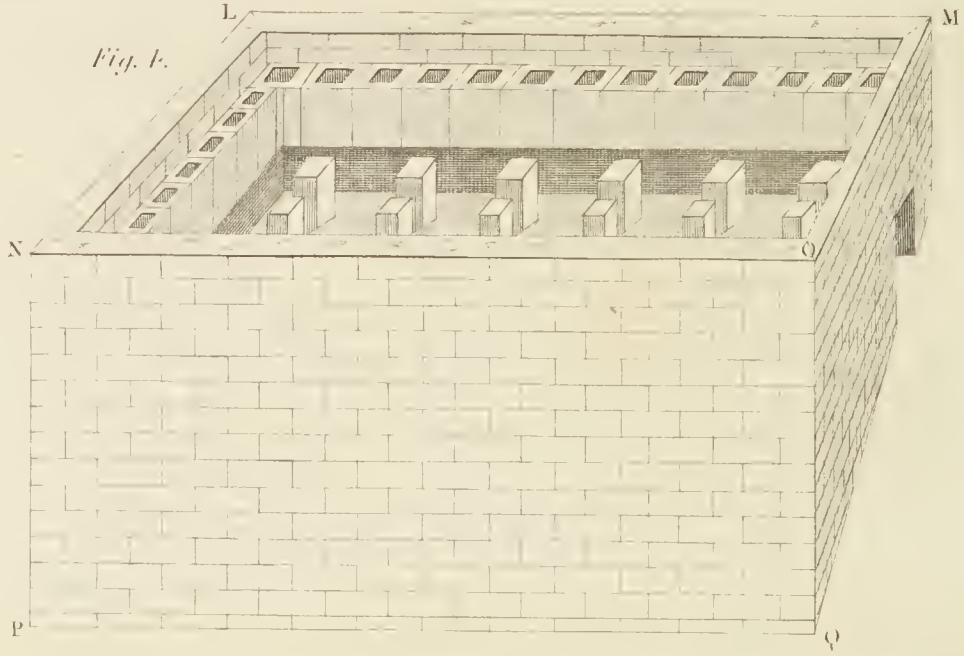
Fig. 6

Fig. 1.



1 2 3 4 5 10 15 Feet

Fig. 4.



A Ritchie del.

W. H. Lizars sc.

PLATE IV.

PLAN OF THE HYPOCAUSTUM OR SUDATORY

discovered at Lincoln 1739.

Fig. 2.

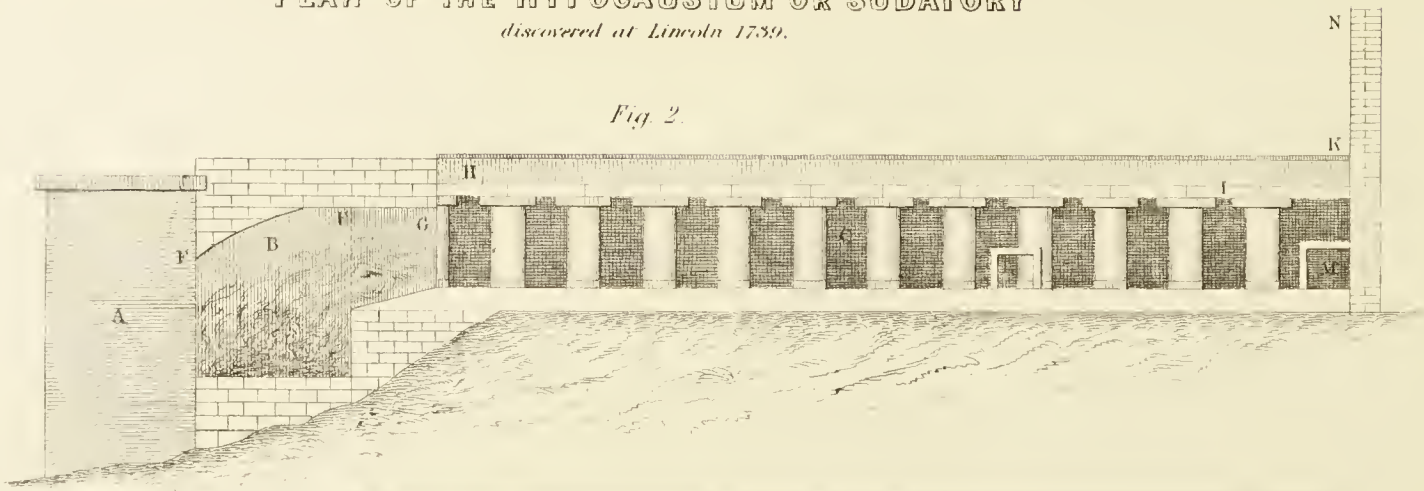


Fig. 3.

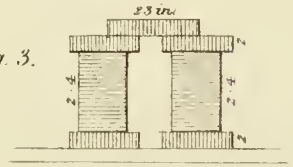


Fig. 5.

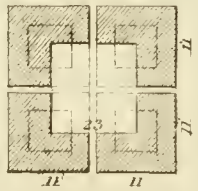
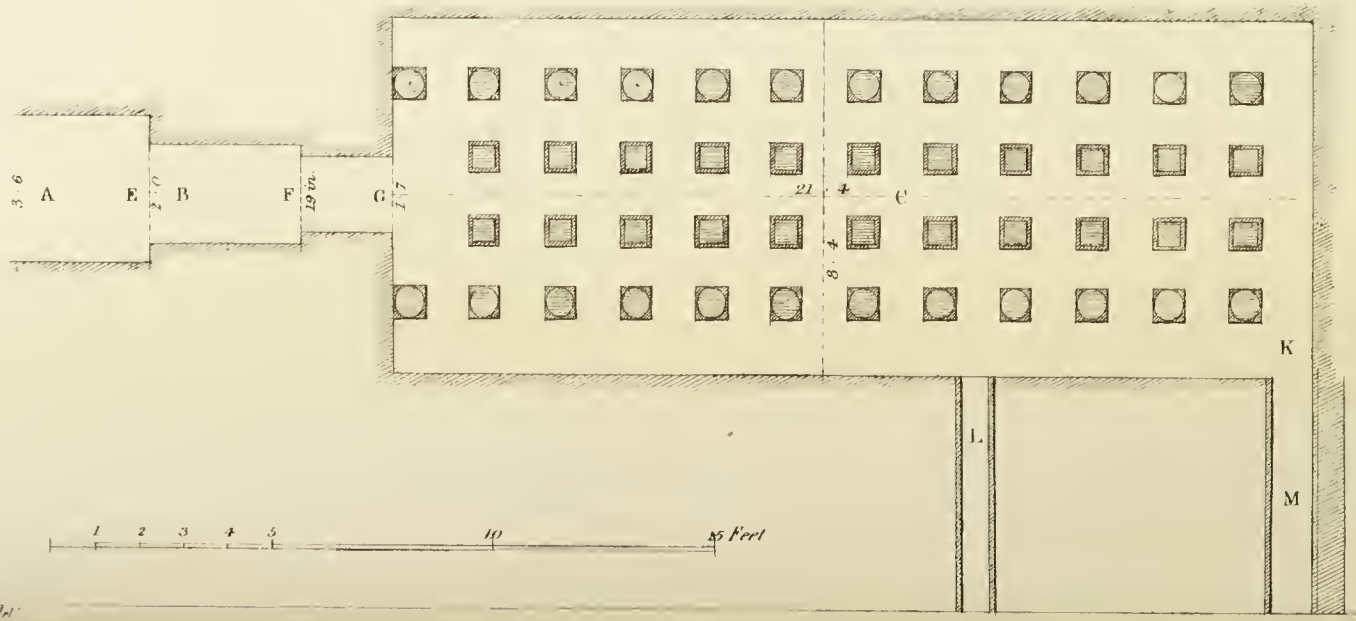
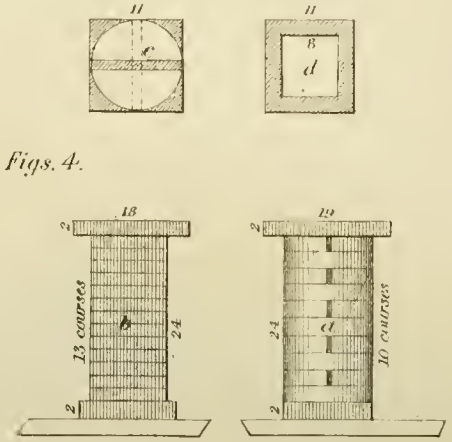


Fig. 1.



Figs. 4.



R. Ritchie del.

W. F. Lizars sc.

found three stone coffins; about 10 or 11 feet from the surface they found some building, and at 13 feet deep they struck into the corner of a vault, which was found to be a Roman hypocaustum, the plan and dimensions of which were then taken, and of which the annexed sketch, Plate IV, will give an idea, figs. 1 and 2.

A, The præfurnium or stoking place, where the stoker stood to manage the fire. It was 3 feet 6 inches square.

B, The fornax, furnace or fireplace, built of brick, and arched over with the same. Its length from E to G, 5½ feet; its height 3 feet at E, and 4 feet at F, rising gradually; 3 feet 6 long from E to F, and 2 feet wide between E, F; 2 feet long from F to G, and 19 inches wide between F G.

C, The alveus or body of the kiln, 21 feet 4 inches long, 8 feet 4 inches broad, and 2 feet 4 inches high. The floor is made of strong cement, composed of lime and sand, brick dust, &c. Upon the floor stand four rows of low pillars made of brick, 11 in a row; the outside rows round the two inner are square; the round ones are about 11 inches in diameter, the others 8 inches square, each standing on a brick 11 inches square, as at fig. 4, and 2 inches thick; the shaft is 2 feet high, upon which lies another brick, 2 inches thick, about 18 inches square, as at fig. 3, which represents the profile of two square pillars, with the square bricks at top and bottom, which makes the whole height of the alveus 2 feet 4 inches; the pillars are jointed with mortar, in courses, one course crossing another. The round pillars being composed of courses of semicircular bricks, as at fig. 4, *a*, laid by pairs, the joints of every course crossing that of the former at right angles, as at fig. 4, *c*, with mortar between. The square pillars are composed of 13 courses of bricks, as at fig. 4, *b*, 8 inches square, as at fig. 4, *d*,—these bricks being thinner than those which compose the round pillars.

On the top of these pillars rests the testudo or floor of

the sudatorium or sweating-room, fig. 2, H 1, which is composed thus,—first, there is a floor of large bricks, 23 inches long and 21 inches broad, which lie over the square bricks on the tops of the pillars, as at fig. 3; the four corners of each brick reaching to the centres of four adjoining pillars, as at fig. 5, where only one of these bricks is represented, bearing the four smaller bricks, with these pillars under them. On this course of bricks is a covering of cement 6 inches thick, and upon that is set a tessellated pavement. The tessellæ of the corner uncovered, K, in figs. 1 and 2, were of a whitish colour.

L and M, figs. 1 and 2, are two tubuli or flues 12 inches wide and 14 inches deep, for carrying off the smoke. The bottoms of them are even with the bottom of the alveus, and they are carried upon a level 15 feet under another room by the side of the hypocaustum, and then, it is presumed, they turned upwards. The walls of this room were plastered, and painted red, blue, and other colours, and the floor tessellated white. This pavement was on a level with the testudo (covering) of the hypocaustum. The flue M, 3 feet from the corner of the hypocaustum, opened at corner K. In sinking the hole at N K, at 5 or 6 feet deep, the workmen came to the wall, which was dug up by pieces. This had been the wall of a room under which the tubuli ran by the side of it, and not over the alveus, but on the east side of it.*

The hypocaust before described, discovered in 1706, it is considered must have been a much hotter room than the latter, for, instead of the flues being carried under another

* When lately building the Coal Exchange, London, the remains were found of a very perfect hypocaust, with a circular sweating-room, about twelve feet diameter, above it. The pillars which support the testudo or floor are composed of square courses of tiles about three inches thick. The surface of the floor is formed with tiles laid in a circular manner. On one side of the room is a raised mass of building supposed to be a sweating-seat, and adjacent to this, a few inches below the level of the floor, there are some square feet remaining of a tessellated pavement.

room, the walls of the sudatory or sweating-room itself were hollow and double, and a great number of flues carried between them, all round the room. The interior of the fornax was greatly impaired by the fire, which must have been very violent. Some small fragments of wood were thrown out in the rubbish at the bottom of the fornax.

From these sketches of the hypocausts, Plates III and IV, found in Britain, accurately taken when they were first discovered, a very clear conception may be formed of the Roman hypocausts, which were extensively applied in the later periods of the Roman empire to heat the Thermæ. Considering the climate in which these and other similar remains have been found, it is more than probable that most of these hypocausts were intended to warm the sitting winter parlours or cœnatiuncula, or cubicula, rather than to be applied, as has been supposed, for sweating-rooms, although they may have been applied to both purposes.

Palladio has given us a valuable treatise, which has been translated from the Italian, concerning what he terms the 'Fires of the Ancients,' which he collected from some writers, and the remains of ancient buildings. This treatise is interesting, not merely from the useful information it affords upon the customs of the ancients, but also from the opinions of one who lived nearly three hundred years ago, and who designed and restored many public edifices. Palladio commences his treatise with expressing his opinion that the Romans were soon sensible that a continued flame and a great heat from live coals were very hurtful to the eyes; they went therefore very wisely about finding out a remedy.

'They found it was dangerous to carry fire about the house from 'one room to another; and since it is but equity to think that their 'intellects were as capable as ours to furnish them with expedients and 'contrivances,' he concluded that they easily perceived how dangerous

furnaces or chimneys were, though not the same, yet not very different from what were then used. 'And how many houses,' he adds, 'how 'much fine and rich furniture, and how many people have we seen 'destroyed by fires occasioned by the firing even of our well-contrived 'chimneys? There are some sorts of little hearths or chafing-dishes 'made of pottery, or iron, or brass, that are carried up and down the 'house. But these are not without their inconveniences or dangers,— 'children are apt to fall upon them—the rooms are filled with smoke— 'the furniture is spoiled or defiled—sparks fall upon the bystanders' 'clothes and set them on fire—they occasion headache, defluxions of the 'eyes, and several more disorders. . . . How many have perished in 'them from want of timely help? . . . It would be endless to enume- 'rate the many mischiefs that have happened by fire-places and chimneys.

'I shall argue from this that the ancients were acquainted with 'these sorts of hearths and firing-places, or they were not; if not, they 'were very happy to be freed from so many inconveniences we are sub- 'ject to by our ordinary fire-places. If they were, they were very pro- 'vident not to use them, and kind to posterity, for not leaving a de- 'scription of them in their writings; they being such mischievous 'things, that the least harm they do is to spoil our houses with smoke, 'hurting our eyes, defacing our fine pictures, defiling our clothes, and 'even consuming our linen, curtains, and furniture.

'We have another sort of fires, viz., the stoves—an abominable 'invention. They cause a continual stench, swell the head, and make 'men drowsy, dull, and lazy. Most people that use them grow tender 'and weak; some cannot stir out of their rooms all the winter, and 'pay dear for their peeping out even in the spring.

'The ancients used to light their fire in a small furnace under the 'earth. Thence they conveyed a great many tubes of different sizes 'into all the different stories and rooms of the house; which tubes or 'pipes were invisible, but laid in the thickness of the walls and ceil- 'ings, just like water-pipes. Each of these opened at that part of the 'furnace which joined to the very wall of the house, and through them 'ascended the heat, and was let in wherever they had a mind it should, 'whether dining-rooms, bed-chambers, or closets; much in the manner 'as you see the heat or steam of water contained in an alembic, to as- 'cend and warm the parts most distant from the fire-place. The heat 'in that manner used to spread so equally, that it warmed the whole 'house alike. It is not so with chimneys or hearths; for if you stand 'near you are scorched; if at any distance, you are frozen. But here a

'very mild warm air spreads all around, according as the fire that warms 'the pipes laid along the wall opposite to the hearth is more or less 'burning.

'Those pipes which dispersed the heat did not open into the very 'furnace, on purpose that neither smoke or flames should get into them; 'but only a warm steam should enter, which they let out again, thereby 'creating a continual moderate heat. The fire needed not be large, 'provided it was continued to supply those confined and enclosed pipes 'with sufficient power of warming.

'This, for certain, was very convenient, and cheap; no danger, no 'filth nor smoke in the rooms; they were free from all inconveniences 'to which our hearths and chimneys expose us. No occasion for chim-'ney sweepers, chafing-dishes, or warming-pans, the causes of so many 'mischiefs, nor for so many contrivances to keep off the cold air and to 'keep our bodies warm. But an equal continued warmth was diffused 'throughout their houses. The pipes were heated, more or less, as the 'severity of the weather and difference of seasons required; for the 'ancients were extremely well skilled in moderating and contriving 'proper degrees of heat; using now and then to cool the air with a fine 'breeze, coming like the breath out of organ pipes, insensibly and agree-'ably, not like the disagreeable winds out of a smith's bellows.

'If princes and wealthy people would once resume this ancient way 'of warming their new built houses, they would do a very beneficial 'work, while it would soon be followed by everybody, because of its 'cheapness and safety.

'These sorts of pipes are yet visible at Rome, in several ancient 'ruined buildings. Many indeed believe that they were water-pipes to 'convey the rain and droppings through the wall; but it is for want of 'recollecting that these pipes are in great numbers, and obliquely placed, 'when no Architect would ever dispose water-pipes in that manner, 'nor in such great numbers.'

In this interesting paper the writer evinces the greatest hostility to the mode of warming houses with braziers, and with open fires and stoves, and strongly recommends a systematic process of warming whole buildings from one furnace placed at the basement of the building, and the heat conveyed through pipes to different parts of the house. It is somewhat singular that the latter method of heating has, after

a lapse of some hundred years, become common in this country in public buildings. Air heated by hot-water pipes or vessels, and hot-water or steam-pipes themselves, have by the author been carried in safety over whole buildings of very great extent, diffusing an equal temperature over them, and which could not be attained either by the use of stoves or open fires. The knowledge of Palladio is thus fully shewn as regards the practices of the ancients in their mode of heating buildings, although it is to be regretted there are not sufficient details afforded by the Roman writers to know their precise mode of the application of the pipes noticed by Palladio. The feeling of the people in this country is so strongly in favour of open fires (though a more expensive plan as regards fuel, inasmuch as several fires are required in place of one), that it has as yet interposed great obstacles to dispensing with the use of such fires; but it may be kept in view that chimneys at the present time are probably improved since the days of Palladio.

The more general plans adopted by the ancients in heating both their public and domestic buildings have now been noticed, from which may be perceived the vast expense and pains they were at to incorporate their heating arrangements with the fabric of the building. That their mode of heating by these artificial means was entirely free from faults is not to be supposed; there was the risk of the escape of the products* of combustion into the building; but we have only to glance at the careful manner the tops of their hypocausts and their smoke-flues were covered with brick-work and cement, to shew they were fully alive to the necessity of

* It is somewhat singular in these times to observe, that notwithstanding the science and philosophy of the present day, less attention in many instances is paid to this important point as respects health than was done by the ancients. Stoves may be seen heating apartments with impure air, the fumes of charcoal, or by gas, thus destroying the vital principle of the air, its oxygen.

guarding against this, as respects their own health. Hollow walls and flues they appear to have been well acquainted with, to prevent the loss of heat by non-conducting mediæ. Many of these houses seem to have been heated as it were with flued or hot walls; the coarser part of the products of combustion remaining in the hypocaustum, and passing off by the smoke flue, while the hot air and heat ascended the vertical pipes or flues. The whole walls of the house and floors thus became a moderately-heated surface, warming the house by conducted and radiated heat from brick flues; and so long as the heat was kept in moderation, and the flues carefully enclosed within the walls, there could arise no danger from their use,—the only evils being the risk of the flues getting obstructed with soot, or the greater one, that the smoke should escape from the flues into the house itself. It is somewhat difficult to understand that part of Palladio's description, wherein he states 'that those pipes 'which dispersed the heat did not open into the furnace.' How they received their heat is not explained;—whether the air in the tubuli or flues was heated and admitted into the house in a pure state, or whether the flues merely heated the walls from the alveus. Another supposition may be made, that the pipes alluded to were heated with steam or hot water, for one can hardly suppose that the flues admitted into the rooms the impure gases from the hypocaustum. We have seen, however, that in the time of Seneca, hot water pipes came to be substitutes to some extent for the heat from the flues of the hypocaustum. It is more than probable that these pipes were applied to a great extent to heat buildings, by heating walls with hot water or steam pipes placed within them, as is now done in garden-walls, which would be free from the objections of the hypocaustum; or another supposition may be hazarded, that the pipes

were surrounded with heat from the alveus, while a current of fresh air, heated in its progress, passed through them; or the pipes themselves, filled with hot water or steam, heated a current of air surrounding them.

It is somewhat singular, and almost goes a long way to prove the antiquity of the customs of the inhabitants of the Celestial Empire—a nation whose claim to great antiquity can hardly be disputed—that the manner of heating the better class of houses of the Chinese is the same in principle as that practised by the Romans, and that the hypocaustum has long been in use in Pekin, where, according to those long resident there,* the winter season is more severe than in England,—the thermometer often falling 20° to 30° below the freezing point. To guard against the cold, many of the houses are made with double walls, and hollow flues beneath the floors —the fire-place being placed upon the exterior wall of the apartment to be heated, or in an adjoining room. From the furnace one main flue, with a branch to right and left, carries the smoke and heated air below the apartment to be heated; this escapes through holes into a cavity or hollow space below the floor, and diffuses itself over it—while the smoke passes off by means of two horizontal lateral flues into the atmosphere. The floor of the apartment is covered with flat tiles or flag-stones bedded in cement, to prevent the escape of the foul air from the flue beneath into the rooms. The chief difference between the Roman hypocaust and the Chinese seems to consist in the latter having a double chamber below the floor.

From this description, it is at once perceived that the plan of heating amongst the Chinese is the same as was practised

* An interesting paper, describing the Chinese stoves, is given in the Phil. Trans., translated from the French by M. Gramont, long resident in China.

by the Romans, and probably coeval in invention. There is little doubt that the marble tessellated floors of the Roman villas were thus warmed, and became hot hearths moderately heated, diffusing a genial heat over the room. The objection to such a mode of heating arises obviously from the tendency, after long use, of the products of combustion to escape through crevices into the rooms, and the liability of the flues themselves to get choked up with soot. But in the case of the Chinese, they, with that regard to economy evinced by this singular people, instead of using coals, which they have, make use of a prepared fuel or compost made of the refuse of coal, clay, cow-dung, or any refuse vegetable matter formed into bricks, and dried in the sun, which gives out very little smoke in the process of combustion. In other cases, wood is made use of for fuel. Both of these prevent the flues of their heating contrivances from getting choked up with soot; and this mode of heating is found to diffuse an equable temperature over the building. Notwithstanding the great antiquity of this method, and the discoveries of modern times, it still continues in use.

I have now shortly pointed out the regard paid by the ancients to salubrity arising from locality and from proper arrangements being provided in their buildings for the introduction of fresh air and ventilation, or renovation of the air; and also described the attention which they paid to warmth, as necessary to maintain health and promote comfort, proportioning that warmth to the general temperature of the atmosphere; I will now proceed briefly to shew that the attention which they evinced in the previous objects to minuteness of detail and comprehensive views were more fully developed in the regard they paid to personal cleanliness, and in providing in their dwelling-houses and in their cities baths for the accommodation of all classes of the community,

which even the ruins of them, yet preserved, have made the wonder and admiration of succeeding ages. At a time like this, when so many attempts are made to bring about sanitary reforms, it cannot but be interesting to observe the vast attention paid by the great progenitors of human civilization, both rulers and people, to personal ablution, which, according to many of the Roman writers (Pliny and others), they considered necessary to maintain health and promote longevity.

The magnificence of the baths of the ancients is known almost to every reader. No one who has studied the histories of Greece or Rome, but must have read of those splendid works of art, the ruins of some of which yet remain, such as a large portion of the Baths of Titus, Dioclesian, and Caracalla. Historians record that there were 850 public baths in Rome itself, and that one Emperor after another vied in erecting public baths of the most superb and ornamental description. It was in the Augustan age that baths became famed for their architectural magnificence. They were not only adapted for cold, tepid, hot, and shower bathing, but places of public resort for amusement, and even study. Emperors and great men bathed in such public baths; and probably in order to make themselves popular with the people, bathed openly along with them, and anecdotes have been handed to posterity of the Emperor Adrian, (A.D. 138), at the public baths, interesting from shewing the habits and manners of the people. Bathing was in great repute in the time of Augustus, from his supposed recovery to health by the use of the cold bath; but it fell for a time into disrepute after the death of Marcellus,* which arose from the improper use of it.

* Marcellus was the son of Marcus Claudius Marcellus and Octavia, the sister of Augustus, and seems to have been endowed by nature with great talents. He was raised to the Curule-Edileship by the Senate, but he died

The description which has been given by A. Palladio of the Thermæ or baths at Rome conveys a better idea of the number, vast extent, and magnificence of those buildings then existing than any other writer. He himself was an eminent Architect of the middle ages, and has left us a valuable record of his talents. He, coming after Michael Angelo, whom he terms 'the divine,' had opportunities of seeing and studying the ruins of ancient Rome at a period in history when the spirit of learning, dawning in Europe, made a research into the antiquities of ancient Rome a matter of great interest. Palladio tells us in an appendix to his work, which was translated from the Italian, and published in 1570, with notes and remarks by Inigo Jones, that the antiquities and sumptuous works of this most celebrated city incited him to compile a small treatise, which he recommended to be read if any one is desirous to acquire a perfect knowledge of so great and so famous a city as Rome was for her renown and magnificent structures, most of which not only the bare accidents of time, but the ravages of war, conflagrations, or earthquakes have destroyed or buried. Seven times, it is stated, did Rome, once mistress of the world, after Constantinople became the capital (A.D. 325), fall into the hands of as many different nations between the years A.D. 364 and A.D. 1527.

Palladio states that the Thermæ* had very large porches,

very suddenly about the early age of eighteen, (B. C. 23,) from, it is said, the injudicious use of the cold bath prescribed by Antonius Musa, the physician of Augustus.

* The large buildings used for the baths were first called Thermæ by the Romans—which word applied not merely to the different baths, but to the whole building. It should be kept in recollection that the baths erected by the Roman emperors here noticed were greatly increased in magnificence and extent from those which existed and were noticed in the time of Vitruvius. Hence, means of heating the piscinæ or hot water ponds for numbers bathing in required a much more extended system of heating than that noticed by him.

marble floors of Mosiac work, plaster walls, and high columns supporting very large arches, and in his time (1533) he mentions that some of the following baths were in a considerable state of preservation :—

'Those of Agrippa (B.C. 36), built by Agrippa between the Church, 'Rotondo, formerly Pantheon, and Minerva, in a place called Giambella, 'where its ruins yet appear. These magnificent baths were erected by 'a son-in-law of Augustus, who is recorded to have built 160 cold and 'hot water baths for the free use of the people.'

[The Rotondo is the famous Pantheon, supposed to have been built by Marcus Agrippa. It was called the Pantheon, because, after Jupiter, it was consecrated to all the gods. This temple has a most beautiful portico in front, in the Corinthian order. In the frieze are these words,—M. AGRIPPA, L. F. Cos. III FECIT.—under which there is another inscription in smaller letters, which shews that the Emperor Septimus Severus and Marcus Aurelius repaired this temple consumed with age about A.D. 203. Agrippa bequeathed his baths and lands for the gratuitous use of the Roman citizens.]

'Those of Nero (who lived A.D. 54) or of Alexander Severus, who 'subsequently enlarged them, (A.D. 235.) They stood near the Church 'of St Eustace, where some of its ruins are yet to be seen.'

'Those of Titus (A.D. 79) stood where now the gardens of S. Pietro 'in Vincola; here they yet appear.'

'Those of Domitian (A.D. 96), raised by the Emperor of that name, 'where now the Monastery of S. Silvester stands, the ruins yet 'appearing.'

'Those of Trajan (A.D. 117) stood on the Equiline Mount, near S. 'Martin's Church, on the other side of which hill stood the baths of the 'Emperor Philippus, the remains of which are yet to be seen near 'S. Matthew's Church.'

'Those of Antoninus (A.D. 161), which Antoninus Caracalla (A.D. '217) began, and Alexander (A.D. 235) finished, on Mount Aventine. 'These are yet half standing, in ruins of a prodigious size, adorned 'with the finest marble and very large columns.'

'Those of Aurelian, built by the Emperor Valerius Aurelianus (A.D. 257) on the Wyke, on the other side of the Tiber, the ruins of which are yet visible.'

'Those of Severus (A.D. 199), built by the Emperor of that name, 'on the other side of the Tiber, of the finest marble, and with beauti-

'ful columns; of which some have been put up in the Churches of S. 'Cecilia and S. Chrysogonus.'

'Those of Gordianus (A.D. 244), adorned with two hundred fine 'columns, stood near the Church of S. Eusebius.'

'Those of Dioclesian (A.D. 284), built by the Emperor of that name, 'are for the most part yet standing near the Church of S. Susanna; 'and are wondrous large. In the building of them forty thousand 'Christians were compelled to work at them for many years by the 'Emperor.'

'Those of Constantine (A.D. 306) were on Mount Quirinalis, the 'remains of which are yet to be seen in the gardens of the illustrious 'family of Ivrea.'

'Those of Novatianus, where now stands the Church of S. Puden-'tiana.'

'Those of Olympius stood where now the Monastery of S. Lawrence 'does.'

To these may be added those erected by Vespasian (A.D. 69), and by Maximus (A.D. 238), and others.

To describe these magnificent structures of past ages would fill volumes; and many valuable works have been published on this subject. It is foreign to my purpose to enter upon any description of these baths in an architectural point of view, farther than to notice those details connected with their modes of heating them, which will develope the knowledge which the ancients possessed on many points with which the moderns are apt to suppose they were unacquainted.

To understand the importance which was attached to bathing amongst all classes of the Roman people, the opinions of one or two of their writers may be referred to. At one period it seems to have been viewed as a remedy for some diseases. The luxury of bathing had increased to such excess that, alluding to the death of Titus, Pliny the younger finds fault with physicians for stating that digestion was aided by the use of the hot bath; for in his time the system of bathing was become so habitual to the people, that

they practised it every day before eating. And bathing was carried to such excess in Adrian's time, that a public edict restrained the use of it to all persons before the eighth hour. We find also Seneca, (who lived in the Emperor Nero's reign (A.D. 64), and was by him, in his old age, put to death,) in one of his Epistles, dated from the villa or country house of Scipio Africanus, who lived about 200 years before him, deplores the excess of luxury his countrymen had fallen into; and draws a comparison between his own times and the simplicity of earlier ages. He gives a description of the splendour and great art of the Roman baths, and laments 'that baths of plebeians were filled with silver pipes, and that 'freed men trod on gems.'

The following passage from Seneca affords a very vivid picture of the times in which he lived:—

'I write to you on my couch from the very villa of Scipio Africanus, 'having first invoked his manes at that altar which I took to be the 'sepulchre of so great a man. . . . . I behold a villa built of squared 'stone, the walls of which enclose a wood, and have towers in the style 'of a fortification; a reservoir lies below the buildings and walks, large 'enough for the use of an army; the bath is close and confined, and dark, 'after the old fashion, for our forefathers combined heat with obscurity. 'I was struck with pleasure when I compared these times of Scipio with 'our own. In this nook did that dread of Carthage, to whom Rome 'owes her having been but once taken, bathe his body, wearied with 'labour; for according to the ancient custom he tilled his grounds him-'self. Under this mean roof did he live; him did this vile pavement 'sustain. But who at this time would submit to such a bath? Poor 'and sordid seems he to himself except the walls do shine with a 'profusion of the most precious materials—unless the marbles of Egypt 'are varied with those of Numidia; unless the walls are ornamented 'with a laborious and variegated plaster after the fashion of painting; 'unless the chambers are covered with glass; unless the Thasian stone, 'formerly a curiosity worthy of being placed in our temples, is made 'to surround our ponds or bathing vessels, into which we cast our bodies 'weakened with immoderate perspiration; unless the water is carried

'through silver pipes. As yet I have spoken only of the plebeian baths, 'but what shall I say when I come to the baths of our freemen?—What 'a profusion of statues? What a number of columns do I see sup-'porting nothing, but placed as an ornament merely on account of 'the expense? What quantities of water murmuring down steps. We 'are come to that height of luxury that we disdain to tread upon any-'thing but precious stones. In this bath of Scipio are small holes 'rather than windows, cut through the wall so as to admit the light 'without injury to the defence of the building; but now we reckon a 'bath fit only for moths and vermin, in which the windows are not so 'disposed as to receive the rays of the sun during its whole course; un-'less we are washed and sunned at the same time; unless from the 'bathing vessel we have a prospect of the sea and land. In fine, what 'excited the admiration of mankind when built, is now rejected as old 'and useless. Thus does luxury find out something new into which 'she might plunge. Formerly the baths were few in number, and 'not much ornamented; for why should a thing be ornamented which 'can be hired for a farthing, and which was designed for use and 'not for indulgence? The water in those days was not poured down 'in drops like a shower, neither did it rise from beneath as from a 'hot spring; nor was the clearness of it considered as a matter of con-'sequence. What a pleasure was there in entering those obscure and 'vulgar baths, the temperature of which you knew was regulated by the 'hands of the Cornelii, Cato, or of Fabius Maximus? For the most 'renowned of Ædiles had, by virtue of their office, the inspection of these 'places when the people assembled, to see that they were kept clean, and 'of a proper and wholesome degree of temperature; not of a heat like 'that of a furnace, such as has been considered proper for the punishment 'of slaves convicted of the highest misdemeanour. We seem now to 'make no distinction between being warm and burning. How many 'do I hear blaming the rusticity of Scipio, who did not admit daylight 'into his baths through wide glass windows, or suffer himself to be 'baked in hot sunshine. . . . . Unhappy man! he knew not how to enjoy 'life. The water he washed in was not quiet and transparent, but after 'rain even thick and muddy. Nor did this mud concern him. He 'came to the bath to refresh himself after his labour, not to wash 'away the perfumes with which he had been anointed. What think 'you some will say of this? I envy not Scipio, he truly lived in exile 'who bathed in this manner. Should you after this be told that he 'did not bathe every day, for those who record the traditions of early

'times say that they washed their arms and legs daily, but that they 'bathed their whole bodies on market days only, it may be answered 'they were then very uncleanly.'

The preceding passages shew the feelings of Seneca upon the effeminacy of his times when contrasted with those of a century or two preceding, which doubtless paved the way to the downfall of the Roman empire. In describing the Roman baths, the idea of Seneca in his epistle has been thus rendered:—

'The walls were composed of Alexandrine marble, the veins of which 'were polished and heightened in such a manner as to look like a picture. 'The edges of the basons were set round with a most valuable kind of 'stone found in Thasius, one of the Greek islands, variegated with views 'of different colours, interspersed with 'streaks of gold.' The water 'was conveyed through silver pipes, and fell by several different descents 'or beautiful cascades. The floors were inlaid with precious gems, and 'an intermixture of statues and colonnades contributed to throw an air of 'elegance and grandeur upon the whole.'

That this picture is not overcoloured ample evidence has been handed down to posterity. Pliny corroborates it, for amongst other luxuries of his time he censures the ladies for having their bathing rooms paved with silver. The Roman baths were filled up with cold, hot, and tepid baths, and sweating and perfuming rooms. They usually began with the hot water and ended with the cold. A very distinct idea of the arrangement of the ancient form of baths used in the later periods of the Roman Empire has been obtained from a copy of a painting which has been frequently referred to, found in a wall forming part of the baths of Titus. In this view we have the frigidarum or cold bath, the tepidarium or tepid bath, the caldarium or hot bath, the laconicum*

* The laconicum is supposed by some writers to have been used where a humid heat from vapour was required, and by others, to have been a dry heat, as the drawing referred to shews the flame within the laconicum. The

PLATE V.

Method understood to be described by Vitruvius for

HEATING THE ROMAN THERMÆ OR BATHS.

Fig. 1.

A *Vasa Aherna, Aria*
B *Hypocaustum*
C *Testudines Alvei*
D *Alveus or Piscina*
E *Baptisterium*
F *Cella Frigidaria*
G *Prepnigeum*

Method understood to be described by Seneca for

HEATING THE PISCINÆ OF THE ROMAN THERMÆ OR BATHS.

Fig. 2.

A *Miliarium*
B *Fistula*
C *Hypocaustum*
D *Cella Caldaria*
E *Cella Tepidaria*
F *Cella Piscinalis*
G *Piscina*

ROMAN THERMÆ OR BATHS AT POMPEII

Excavated 1824. Shewing the method by which they were Heated.

Fig. 3.

Frigidarium *Tepidarium* *Caldarium*

R. Ritchie del.t W.H. Lizars sc

or dry stove or sweating room, the concamerata sudatio, vaulted vapour bath or sweating room, the balneum or washing room, the eleôthesium or oil anointing room, and the hypocaustum or stove, all distinctly shewn.

But a still more important discovery of the forms of the ancient baths has been made in Pompeii and Herculaneum. The baths of Pompeii were excavated in 1824, and have been found to excel all other buildings there discovered in magnificence, and were found in a great state of preservation. The construction of these baths strongly coincides with the descriptions of Vitruvius and other Roman writers. They occupy a large extent, and are divided into three separate compartments, one for fire places and for the use of servants, one for the men bathers, and another for the women. At one end of a large oblong apartment was a circular room with a dome roof, enclosed by a square, the angles of which formed four alcoves, called scholæ.* In the circle was placed the piscina or natatio (swimming bath.) This vase was sometimes termed the baptisterium. It was 12 feet 10 inches in diameter, and 2 feet 9 inches deep, and it was entirely lined with white marble. The section, Plate V, fig. 3, shews the arrangement of a portion of the baths as they had existed, looking towards the circular apartment. The ceiling of the tepidarium had been highly ornamented with figures and finely painted. In it was found the brazier or foculare noticed page 198. This apartment was also moderately warmed from the hypocaust which heated the caldarium, in the recesses of which, shewn in fig. 3, it is supposed the clothes of bathers were placed before entering the inner

terms laconicum, vaporarium, sudatorium, labrum, hypocaustum, &c., are sometimes used with different significations. The latter appears to have meant a furnace of any kind under ground.

* The term schola was likewise given to the platform round the bath; or the schola was a hemicycle connected with it.

apartment or sudatorium or laconicum. It is difficult to understand how charcoal could be burned with impunity in the frigidarium. It is probable that the room was chiefly heated from the hypocaust. The caldarium or hot bath apartment was 37 feet long by 17 feet broad, and plainer than the others, the floor and hollow walls of which were also heated, as shewn in fig. 3. At one end of this room was the hot bath, and at the other end of it the labrum or vase of hot water. The latter is placed in an alcove. It was a vase of white marble 8 feet in diameter, very shallow, being only 18 inches deep. In the centre of the bottom was a brass tube, by which it is supposed the water had been thrown up in a shower, or for pouring cold or tepid water on the head of the bather coming from the hot bath. The hot water bath at the other end of the apartment was a tank 16 feet long, 4 feet broad, and 2 feet deep. The hot water flowing from the cauldron entered the bath at one of the angles. The three boilers are shown one above the other, heated by the same fire. As the water in the upper boiler must have been nearly cold, it is supposed that it supplied the labrum. It is probable that the same hypocaustum heated several sets of these boilers. The natatio was supplied with water by an adjacent cistern.

If we now turn from the description of visible remains of a bath of a Roman city which was destroyed by the eruption of Vesuvius, 23d August A.D. 79, in the first year of the reign of the Emperor Titus,* to the transmitted writings of Vitruvius, who flourished long before the destruction of Pompeii, we find the remains found in that ill-fated city fully bear out

* It had been previously, A.D. 63, almost destroyed by an earthquake. Pompeii is situated five miles from Vesuvius, to which it owes its destruction. Pliny, in his letters, gives a most vivid picture of the dreadful eruption and the death of his uncle; he mentions that he was at that time eighteen years of age.

his descriptions. The information which Vitruvius gives is interesting as shewing the opinions of one who designed these baths as to situation and arrangement, although there is a great want of that minuteness of detail necessary to understand the subject properly; but it is obvious that his work in this and other points is addressed to those who had the objects before them. There is a remarkable resemblance in the interior construction of all the Roman baths, which, in the main features, followed the plan of the Greeks; and as the latter people attached their baths to the palæstra or gymnasia, in which their athletic exercises were performed, so did the Romans combine with their baths of later erection places of amusement and for bodily exercise.

Vitruvius remarks that 'the situation chosen for baths 'ought to be sheltered from the north and north-east. The 'caldaria and tepidaria should be made to receive their 'light from the winter west; or they may both be made to 'face the south; because the general time of bathing is from 'mid-day to sunset. One thing necessary to be observed is, 'that the caldaria of that division of the bath which is 'appropriated to the women should be contiguous to that 'exclusively used by the men, and have the same aspect, for 'then the coppers of both may be heated from the same 'furnace.

'Three brazen vessels (vasa ahena tria) are fixed over 'the furnace (these were the boilers or cisterns), which are 'severally called caldarium, tepidarium, and frigidarium; 'they are so arranged, that whatever heated water is taken 'from the first, is replaced by warm water from the second, 'the deficiency of which is supplied in a similar manner 'from the third. The concave coverings of the small tubes 'of both baths are likewise heated from the same furnace.'

The writer then proceeds to mention the construction of

the furnaces previously noticed, page 205, and to describe the manner of making the ceilings of the caldaria, which should be made double, covered with tiles, supported by iron work, &c.

The magnitude of the baths must be proportioned to the population of the place, but in all instances its dimensions should be such that the width, exclusive of the schola of the bath and the passages around, may be a third part less than the length. The bath should receive its light from the upper part of the apartment on every side, so that persons who are standing around may not intercept the light from those who are using the bath. The schola of the labrum (bathing vessel) should be sufficient to accommodate those who are obliged to wait until the bath is unoccupied. The alvei between the walls and the plateum (the wall between the columns) ought not to be less than six feet, of which space the lower step and bench occupy each two.

The laconicum and sudatories should be contiguous to the tepidarium. The height of the latter from the floor to the line whence the hemispherical roof springs, should be equal to their width. The air is admitted through an aperture in the centre of the roof, from whence a brazen shield is suspended.

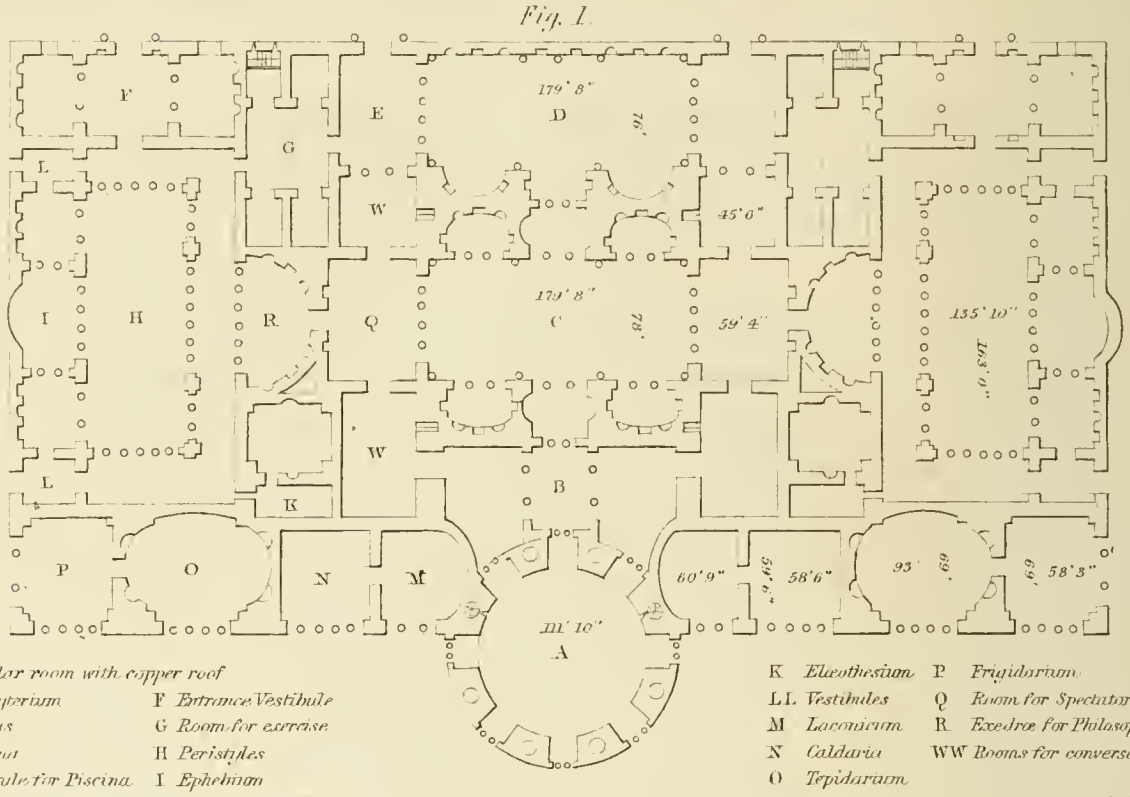
The temperature of the sudatory (sweating room) is regulated by elevating or lowering the shield. The plan of the laconicum should be circular, in order that the flame and heat within it may be equally diffused over its concave surface.

The painting found in the baths of Titus exhibits a laconicum of a circular form within the sudatia concamerata. According to this, the laconicum forms a part of the sweating bath, and seems intended for the purpose of warming it. W. Wilkins, M.A., a translator of Vitruvius, states that the

PLATE VI.

ROMAN THERMÆ OF ANTONINUS CARACALLA.

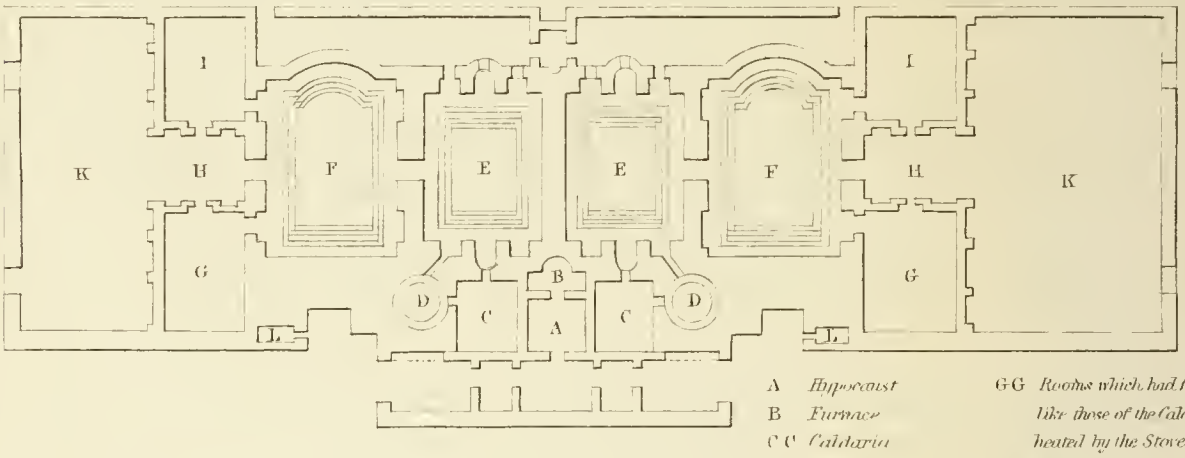
Fig. 1.



A *Circular room with copper roof*
B *Apodyterium*
C *Xystus*
D *Piscina*
E *Vestibule for Piscina*
F *Entrance Vestibule*
G *Room for exercise*
H *Peristyles*
I *Ephebium*
K *Eleothesium*
LL *Vestibules*
M *Laconicum*
N *Caldaria*
O *Tepidarium*
P *Frigidarium*
Q *Room for Spectators*
R *Exedræ for Philosophers*
WW *Rooms for conversation*

ROMAN THERMÆ OR BATHS
at Baden-weiler.

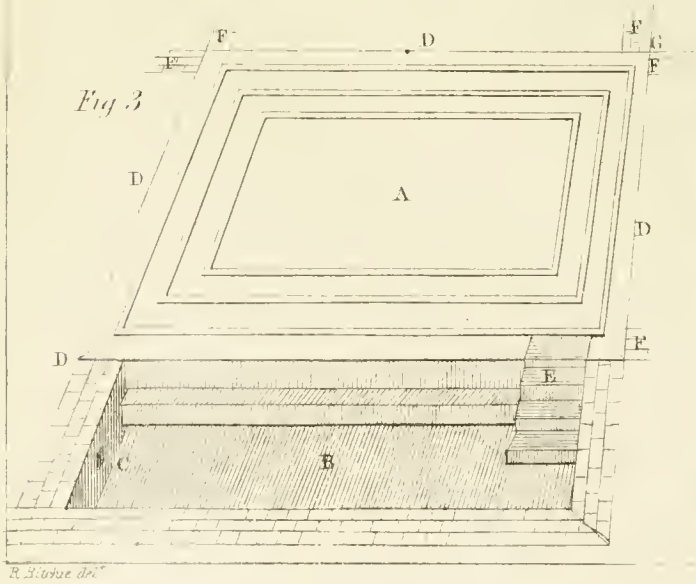
Fig. 2.



A *Hypocaust*
B *Furnace*
C C *Caldaria*
D D *Vaulted Sudatories*
E E *Tepidaria*
F F *Frigidaria*
G G *Rooms which had floors like those of the Caldaria heated by the Stoves* L L
H H *Vestibules*
I I *Eleothesia*
K K *Exedræ*

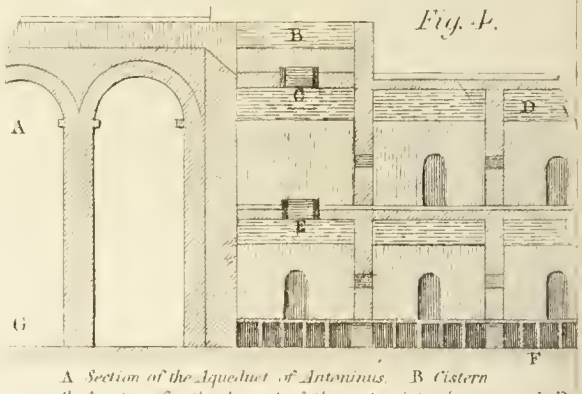
Remains of ROMAN BATH discovered in Sussex 1717.

Fig. 3



CASTELLUM OF ANTONINUS' BATHS

Fig. 4.



A *Section of the Aqueduct of Antoninus.* B *Cistern*
C *Aperture for the descent of the water into the receptacle* D
E *Another receptacle for water.* F *Hypocaustum*

R. Burton del. W. J. Taylor sc.

baths at Baden, in Germany, are the best remains of Roman baths to illustrate the description of Vitruvius; but the baths described by him were buildings of much less importance than the Thermæ, which were introduced during the reign of Augustus by Agrippa.

The Thermæ contained not only apartments for bathing, but likewise exedræ (rooms for study or discourse), xysta (covered walks), and every other part of a Greek palæstra, for gymnastic sports, which Vitruvius enumerates. The most celebrated were those of Domitian, Antoninus, and Dioclesian. The baths at Baden contained a set of baths for men and women, with the several apartments generally attached to them. The plan of these baths shown in Plate VI, fig. 2, is from that given by Wilkins and by Roder in the Berlin edition of Vitruvius. The letters in the plan give the names of the different apartments. The one half of the building was intended for the male sex, and the other half for the female, and are exactly counterpart of each other, which seems to have been the plan of most of the Roman baths, and was probably adopted from the directions of Vitruvius.

The very perfect arrangement displayed in this building shews the importance which was attached to the construction of these baths. It is, perhaps, to be regretted that in the works of the Roman writers the details are not given with that minuteness which renders descriptions easily followed. It is generally supposed that the Romans were ignorant of the principle that water rose to the height of its source after passing through a lower level, but this is a mistake, no doubt arising from the remains of those stupendous aqueducts which this enterprising people constructed at a vast expense, to supply their cities with water. Indisputable evidence has been obtained amongst the baths and fountains of the ruins of Pompeii, that the Romans were

conversant with the means of causing water to ascend through pipes, conduits, and jets d'eau, although they might be unable to construct tubes of sufficient strength to resist the pressure of a large column of water, which might induce them, in bringing in large supplies to their cities, to have recourse to aqueducts. The water-pipes the Romans used were made of lead, earthenware, or wood. It is also stated in the Silvæ of Statius that the Aqua Martia passed the Anio in leaden pipes. Vitruvius also gives instructions for the conveyance of water in pipes. On the ascent of water, we have the words of Pliny, who has said that water in leaden pipes rises to the height of its source,—' aqua in vel ' e plumbo subit altitudinem exortus sui.'—(Plin. Hist. Nat.)

The water in the Roman cities was collected in reservoirs called castella, and from thence distributed in leaden pipes through the city. Small reservoirs were placed in the thermæ upon a higher level than the baths, that it might flow more rapidly into them and into the copper vessels in which it was heated. I have quoted from Vitruvius that three brazen vessels were fixed over the furnace, which were called the caldarium the lowest, tepidarium the second, and frigidarium the upper. The three vessels were placed in a room above the furnace-chamber, and built as requisite, one above the other, so as a regular supply of either cold, tepid, or hot water, might be drawn to the baths as required. A constant communication was maintained between the three vessels, so that as fast as the hot water was drawn off, it filled from the second vessel, which would slightly reduce the temperature, and the tepidarium in its turn would be supplied from the frigidarium or cold boiler, and the latter from the aqueduct, so that the heat which was not taken up by the first boiler, passed on to the second, and instead of being wasted, did its office in preparing the contents of the second for the higher

temperature which it was to obtain in the first. The terms of caldarium, tepidarium, and frigidarium, were not only applied to the boilers, but also the apartments in which the baths were. The coppers and reservoir were elevated considerably above the baths, to cause the water to flow more rapidly. The warm baths in both rooms were adjacent to each other, for the sake of being easily heated. In the midst of the building, on the ground floor, was the heating-room or hypocaustum, by which not only the water for bathing, but sometimes also the floors of the adjacent rooms were warmed. It is, however, unnecessary to describe it, as it was constructed nearly in the same manner as those previously noticed, used for heating their houses. Castell, in his work upon the ancients, gives a drawing shewing his idea of the arrangement of the hypocaustum at Pliny Villas—and there can be no doubt that the wealthy Romans had private baths at their houses of the utmost magnificence. In Plate V, fig. 1, Castell attempts to shew what he conceives to be the idea of Vitruvius for heating the Roman baths, and the plan adopted at Pliny's Villas. In fig. 1 the three vessels are shown in a different position from fig. 3. The former is the most probable plan to have been adopted, and the hypocaustum is also applied to assist in the heating of the large bathing vessel. There is, however, considerable doubt entertained by commentators whether the heating vessels containing the water were thus arranged one above the other, as is likewise shewn in the drawing from the baths of Titus, or whether they were not placed on the same level, and the water flowed from the one to the other. The very perfect remains of a Roman bath which were discovered in Sussex, and described in the Phil. Trans. 1717, does not throw any light upon the mode of heating it which had been adopted. In it were found two holes, one of 3 inches in the bottom, and another of 4 inches

above it, the first to let out the water, and the latter to let it in. In the apartment in which the bath was placed, in length 17 feet and in breadth 11 feet, a fine tesselated pavement was found; both are shown in Plate VI, fig. 3. A, pavement. B, bath. C, the sink and other passage for the water. D, the Roman bricks which bound the wall. E, steps and landing place of the bath. F, foundation walls continued in several ways. G, corner of a large space paved with bricks.

As the refinement of the Romans advanced, and as luxury increased, the plan of heating baths where there was so much hot water required would no longer answer the purpose —the cold water that flowed into the one vessel as fast as the hot water was drawn off cooled the water faster than the fire could heat it, and consequently the water in the bath became chilled, and inconvenience must have arisen from persons waiting some time before the hot water baths could be used. Of this fact Vitruvius does not appear to have been ignorant, for he says, 'Testudinesque alveorum ex communi hypocauso calefacientur,' by which he meant that the arches under the bason, which received the fire of the hypocaustum would keep the water in the bason longer warm; however, these precautions could not even enable a supply of warm water always to be obtained. In order to remedy the defect of heating the hot-baths from the brazen vessels over the hypocaustum, the Romans were obliged to have recourse to other means to warm the water, as at a later period of the Roman history, Seneca informs us that the plan existed of heating their large baths by passing the water through the fire in a brass pipe, which was more or less hot, according to its length of progress. Sometimes they used only one winding pipe, without other vessel, which, from its serpentine form, was called Draco; but it was conceived the better way to receive

the cold water in a large boiler or vessel before it entered the winding pipes. These vessels were probably of several forms, and the pipes were differently disposed ; but that which seems to have been the vessel generally approved of was the miliarium, mentioned by Seneca and other writers, of which Palladius also gives the description—'Miliarium vero plumbeum cui ærea ' patina subest, inter soliorum spatia forinsecus statuimus ' fornace subjecta, ad quod miliarium fistula frigidaria diriga- ' tur, et ab hoc ad solium similis magnitudinis fistula pro- ' cedat, quæ tantum calidæ ducat interius, quantum fistula illi ' frigidi liquoris intulerit.' * From this, and the passage of Seneca it appears that the miliarium was a leaden vessel of a large circumference, the middle part of which was open for the winding pipe, and for the draught of the fire to pass through. The vessel of water, that surrounded the flame or draught of the fire, was also placed upon a part of the same fire, and for that reason was obliged to have the bottom of it of brass, as were also the pipes. Castell, from the preceding description, gives the annexed sketch of the ' Draco,' Plate V, fig. 2, in which a section of the miliarium B, is shewn heated from the furnace beneath, and supplying a stream of hot water to the piscina. This sketch being designed from the general description of the Roman authors, can convey but an imperfect idea of the apparatus ; but I have preferred this illustration to designing a plan of it for myself, or adopting other delineations. Castell thinks that the piscina or hot water swimming baths of very large size probably had round them more than one of these vessels,

* Which may be thus translated,—We place on the outside in the spaces between the bathing vessels a hollow column of lead with a brazen flat bottom, and under it a furnace, into this column the pipe of the cold water cistern is directly led, and from it another pipe of the same calibre proceeds to the bathing vessel, which conveys into it as much hot water as is brought in a cold state to the column by the pipe from the cold water cistern.—*Lib. I.*

but those of a moderate size might, without much expense of fire, have been sufficiently supplied from one, as from a fountain of hot water; so that there was no occasion to keep a fire under the bath, and thus the piscina could have been raised as high as the top of the miliarium, and these balineæ pensiles (suspended baths), made as large as those on the ground. The principal pleasure proposed by these airy baths was that of a prospect while swimming in them, as noticed by Seneca.

The whole details connected with the Roman baths have been developed in the interesting and valuable work by Cameron, architect, published in London eighty years ago, who appears to have taken up this subject in an enthusiastic manner and to have bestowed much labour upon the publication of the beautiful designs of the ancient thermæ. The author tells us that he owes much in giving the restored designs of the ancient baths to the discovery of the labours of Palladio, who did not live to publish his work on baths, but which was given to the world by Lord Burlington. In Cameron's work we have an interesting examination into the mode by which it was supposed possible the Romans could heat the enormous supplies of water which were required for their baths. He seemed to think A. Baccius, who had treated the matter more professedly than any other modern author, was wrong in supposing that the water which supplied these thermæ came from castella placed without them, and that they made use of machines to raise it to the height he had observed from the ruins of Dioclesian's baths.* Mr Cameron thinks this supposition full of difficulties, and is of opinion

* The piscina or natatio of those baths was 200 feet long by half that width, and was supplied with water from one of the aqueducts. The vast extent of these baths may be surmised, when it is stated that they contained 3000 cells solely for bathing, besides numerous other apartments.

that by reference to the thermæ of Antoninus Caracalla* (A.D. 217), the mystery will be cleared up, and that the Romans could be under no difficulty of heating the greatest body of water that their extensive thermæ required.

A portion of the thermæ is shewn in Plate VI, fig. 1, from a restored design by Palladio, said to be taken from actual measurement of the remains. The plan is marked in feet and inches, from which may be judged the prodigious extent of the erection, which in size was even surpassed by others. The two halves of the building were alike. A large piscina was placed in the middle between the two, and a circular room, A, of large diameter, called the solar cell, formed the centre of the front. The vaulted ceiling of this room was entirely supported by brass or copper, with which also the lattices of the windows were overlaid. According to the Roman writer Spartianus Ælius, this cell was a wonder in the age he lived in, and could not be exceeded in beauty of workmanship.

Besides this large building there was an extensive range of chambers or cells for bathing behind it, forming a part of the castellum, shewn in the section, Plate VI, fig. 4. In this and another portion of the building, before the main one, were placed the extensive apparatus for heating the water. The castellum was supplied with water from A, fig. 4, the aqueduct Antoninus. The water was first received from it into a cistern, B, at the top of the building, and thence it passed through an aperture, C, into a large open chamber D, where it was exposed to the rays of the sun. From thence it passed at E into the lowest chamber F, placed immediately over and exposed to the heat of the hypocaustum, which was at the basement of the building, G, level with the ground.

By the plan of this castellum it appears that there were

* The remains of those baths at Rome are stated to be in length over the walls 1840 feet, and in breadth 1476 feet.

twenty-eight vaulted rooms, above a hundred feet distant from the main building, placed over the hypocaustum, built in a straight line in two divisions, fourteen on each side, and having all a communication with each other. Above these rooms there were other twenty-eight similar ones, shewn in the section, which had no communication with those below excepting by the aperture E. Upon the top of all was a spacious receptacle, not very deep, but extending the whole length of the castellum, where the water was considerably heated by the influence of the sun before it passed into the several chambers. The use of the cistern above it seems to have been to promote a more gentle flow of the water into the receptacle, that its surface might not be ruffled by the least agitation, as the tranquillity of the water made it acquire all the advantages the influence of the sun could give it. The twenty-eight vaulted lower chambers filled with water, being directly above the hypocaustum, were first heated, which was assisted from only one of them having a communication with the external air by the small apertures C and E. To give the water a heat sufficient for bathing, flues were provided. The chambers above the first set, heated with flues from the hypocaustum, served as a reservoir of tepid water for those below. The water they received was likewise heated by the sun. When the time for bathing came, the cocks were turned to admit the hot water from the lower chambers into the labra of the baths, to which it would run with great velocity, and ascend a perpendicular height in the thermæ equal to the surface of the receptacle in the castellum. To prevent the water cooling as it passed under ground, they were all carefully surrounded with flues from the præfurnium, so that these tubes were in the centre of a funnel, and always much heated before the water entered them. Each of these chambers, within the walls,

was 49 feet 6 inches long, by 27 feet 6 inches wide, and about 30 feet high, the number of superficial feet in the bottom of the rooms being 38,115. If 30 feet be allowed for the mean height, the whole quantity of water in these lower rooms will amount to 1,143,450 cubic feet, and the like quantity must be allowed from the upper rooms. Allowing, therefore, 8 cubic feet of warm water as sufficient for one man to bathe in, and that the water was preserved in a bathing heat in the Labrum for half an hour, the whole consumption of hot water, in this given time, for 18,000 people, would be 144,000 cubic feet. By this calculation, there would be a sufficient quantity of water for three hours for 108,000 people. The water, however, would gradually cool as it flowed in from the higher chambers.

It does not appear when the Romans first fell upon these expedients for heating such large bodies of water,—whether it was their own invention or brought from the East. It was no doubt the result of great experience. It has been supposed that it was not more ancient than the time of Augustus, in whose reign it is stated by Dio Cassius that Mæcenas first instituted a swimming bath of warm water, or a calida piscina. The mode in which such large quantities of water were heated, must, notwithstanding these calculations and descriptions, be considered as, to some extent, conjectural. Knowing that the Romans possessed other inventions for the purpose, it is more than probable that the plan mentioned by Seneca, already described, was as much used for the purpose as that of the hypocaustum, and that many of the piscinæ were heated by means of miliaria. By having a number of the latter placed around the large hot water swimming ponds and bathing cells, a constant supply of hot water would be made to flow in for that which was run off.

It has thus been shewn that to all those points in domestic Architecture connected with health and comfort, the ancients paid the same regard as they did to those graces of Sculpture and external Architecture which have made their works models for all succeeding ages. I have as much as possible made extracts from the works of the ancients themselves to illustrate the points I have considered in this paper; for no stronger proof can be afforded than what can be obtained from the contemporary writers whose works have been handed down to posterity. Were it necessary, it could be shewn that the ancients were equally distinguished for their knowledge in other branches, although wanting in some sciences which the discoveries of modern times have given to us. In the construction of their basilicas or halls of justice, the same skill was displayed as in their thermæ and villas. In other matters of detail, both in domestic utensils and rural implements, they were equally distinguished; the latter point I have noticed in a work which I published in 1849 (the Farm Engineer, a Treatise on Barn Machinery, &c.) How this singular people acquired and long retained so much knowledge, when all the world around them may be said to have been sunk in comparative darkness or semi-barbarism, and how the great nation fell from the high position, and is now numbered amongst the things that were, are subjects of interesting investigation which have long occupied attention, and evince the inscrutable designs of Divine Providence in human affairs. One thing we ought not to forget, that though the pages of their history record many despotic acts of cruelty aud monstrous idolatry, yet by the conversion of Constantine to Christianity, the great onward movement and cause—the enlightenment and refinement of mankind—was set in a new course of progression.

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No. XIII.

ON THE GEOMETRIC PRINCIPLE OF BEAUTY IN THE MOULDINGS OF ANCIENT GRECIAN ARCHITECTURE, WITH PRACTICAL ILLUSTRATIONS.

BY

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[*Read at the Meeting of the Institute in Edinburgh on 27th March* 1851.]

When one of my profession presents himself before a meeting of an Architectural Institute to read a paper upon a subject in any way more intimately connected with so comprehensive an art than that of his own practice, some apology on his part is demanded.

I therefore trust that as the application of æsthetic science in Architecture takes a very wide range, commencing with the simply beautiful in art, and approaching the grandly sublime in nature, and that as I have on this occasion confined my illustrations to some architectural details which lie at the very threshold of that science, and regarding

which there still exists much difference of opinion amongst architects themselves, the slightness of the aggression will be some excuse.

In the article 'Architecture' in the Encyclopædia Britannica, its author observes,—'Greek Architecture is distin-'guished for nothing more than for the grace and beauty of 'its mouldings; and it may be remarked of them generally, 'that they are eccentric and not regular curves,'—and adds, that 'the hand alone, directed by good taste, can adapt them 'to their purpose and give them the spirit and feeling which 'renders them effective and pleasing.' But the author of a similar article in the Encyclopædia Metropolitana is of a different opinion. He says that 'the outline of a section of a Greek 'moulding is, in almost every case, a portion of some conic 'section, which' he adds, 'may be either elliptical, para-'bolical, or hyperbolical.' Thus it appears that these two great authorities are diametrically opposed to each other on the subject of these curves; while a later investigator (Mr Penrose) has endeavoured to prove that all the curves of the mouldings of the Parthenon at Athens are either parabolical or hyperbolical. The subject is therefore still open to discussion. But instead of attempting by any process of measurement the difficult task of endeavouring to prove which of these kinds of curved lines have actually been employed in the construction of mouldings in the ancient Architecture of Greece, I shall endeavour to point out which of them is the most practically efficient to be employed in the reproduction of similar mouldings in the greatest beauty and variety.

It will, however, be necessary, in the first place, to show what are the primary elements of all architectural forms. For this purpose I shall take the right angle as produced by the meeting of a vertical with a horizontal line for a funda-

mental angle, and deduce from its division these elements in the following simple manner:—To produce a figure from the meeting of the vertical with the horizontal line, an inclined or oblique line is required, and the figure produced by these lines is a right angled triangle, either isosceles or scalene, its parts being a right angle and two smaller angles, which together are equal to another right angle. One of the smaller angles is that made by the oblique line with the vertical line, and the other, that made by the same line with the horizontal line. If we therefore name the triangle after the smallest of these angles, the other two are understood, and a very simple terminology may thus be established. I therefore name every right angled triangle after its smallest angle. For instance, a right angled scalene triangle, fig. 1, Plate VII, whose hypothenuse makes an angle of 30° with its horizontal side, I call the horizontal scalene triangle of ($\frac{1}{3}$), because 30° make one-third of the right angle. But, on the other hand, when the hypothenuse of the same triangle (fig. 2) makes an angle of 30° with its vertical side, I call it, for the same reason, the vertical scalene triangle of ($\frac{1}{3}$), and thus every right angled triangle may be named.

The same terminology may be extended to rectangles. For instance, when these triangles are united in pairs by their hypothenuses, the rectangles they form (figs. 3 and 4) may respectively be termed the horizontal and vertical rectangles of ($\frac{1}{3}$). When the vertical angle is 45° or $\frac{1}{2}$ the right angle, the isosceles triangle (fig. 5) may be termed simply the right angled triangle of ($\frac{1}{2}$). And when two of these triangles are united by their hypothenuses, the equilateral rectangle or perfect square is thus formed, which may in like manner be termed the rectangle of ($\frac{1}{2}$). Thus every rectangle as well as every triangle may have a name, which at

once distinguishes it from every other figure of its own kind, and which, at the same time, conveys a perfect idea of its relative proportions.

The same terminology is equally applicable to isosceles triangles, for when the same right angled triangles are united in pairs by their sides, (as in figures 7, 8, and 9), the two first of these triangles may be termed the horizontal and vertical isosceles triangles of ($\frac{1}{3}$), and the third simply the isosceles triangle of ($\frac{1}{2}$), by which names the relative proportions of their parts may also be perfectly understood. These two figures are the primary elements of all architectural forms.

Each rectangle and each isosceles triangle has a curvilinear figure which belongs to it, and to which may be applied the same simple but comprehensive terminology. These curvilinear figures are the circle, the ellipse, and the composite or inclined ellipse, and they may be called the secondary elements in the æsthetics of Architecture. The first of these belongs to the perfect square, for its axes, like the sides of that figure, are all equal. The second belongs to every other rectangle agreeably to the proportions of its elementary angle. Thus fig. 1, Plate VIII, may be termed the curvilinear figure of ($\frac{1}{2}$); fig. 2, the horizontal curvilinear figure of ($\frac{1}{3}$); fig. 3, the isosceles curvilinear figure of ($\frac{1}{3}$); and fig. 4, the horizontal isosceles curvilinear figure of ($\frac{1}{3}$).

These two latter figures, although each described by one continuous line, are when analyzed found to be composed of a series of ellipses harmonically combined—the first amounting to twelve, and the second to ten. Two of these ellipses are always horizontal, and the remainder inclined. ([a]) As this figure has two elementary angles, one of which determines its axis, and the other its inclination, the various combinations of these angles lead to great variety.

These are the three kinds of curves which belong to the rectangle and isosceles triangle, and which I conceive to be, along with these two rectilinear figures, capable of producing all the beauty of abstract form of which Architecture is susceptible, and that neither parabolic nor hyperbolic curves are requisite in the æsthetics of that art.

In my present illustrations of the harmonious combination of these elements, I shall confine myself to the following mouldings which decorate the Doric temples of Ancient Greece, namely—the *Ovolo*—the *Cyma Recta*—the *Cyma Reversa* or *Ogie*—the *Cavetta*—the *Bead*—and the *Hawk's Beak.*

THE OVOLO WITH FILLET AND BEAD.

This moulding is one of the most simple applications of the curve of an inclined ellipse. It is sometimes accompanied by a fillet, sometimes by a bead, and sometimes by a cavetta; and the proportions of these accompaniments seem derivable from the inclined ellipse, of which the body of the moulding is composed. For example, figure 1, Plate IX, is the section of an ovolo moulding, similar to that which surmounts the pediment of the Parthenon at Athens, and it may be constructed as follows:—Let the line A B represent the vertical depth of the intended ovolo moulding, including its fillet. Through A draw A C at an angle of ($\frac{1}{3}$) with A B. Taking A C as the major axis, describe the inclined ellipse of ($\frac{1}{3}$), whose foci are D and G, and centre S. Through D and G draw perpendiculars to the axis, meeting the ellipse in E and H. And through A, E, and H, draw horizontal lines P Q, K L, B C. Through S draw a vertical line S M R. Make A P K U a square, and the section is complete; M R representing a part of the corona. Thus the rectilinear accompani-

ments being deduced from the inclined ellipse, which gives the curve of the moulding, all the parts relate harmonically to each other. This example may be termed simply the vertical ovolo of ($\frac{1}{3}$), because the angle of its curvature and the angle of its inclination are both 30° or $\frac{1}{3}$ the right angle.

The next example, figure 2, is an ovolo of ($\frac{1}{3}$) and ($\frac{3}{8}$), that is, its angle of curvature is $\frac{1}{3}$ the right angle, or 30°, and its angle of inclination 33° 45′, or $\frac{3}{8}$ the right angle. This is accompanied by the bead, and is constructed as follows:—Let the line D B represent the full vertical depth of the intended ovolo moulding, including its bead and fillet, and D Q the vertical depth of the ovolo curve. Through D draw A D M at an angle of ($\frac{3}{8}$) with D B, and through D draw a horizontal line K L, and through Q another horizontal line Q N, cutting A M in C. With the inferior end of its major axis at C and its superior focus in D describe the ellipse of ($\frac{1}{3}$), whose foci are D and G, and centre S. Through G and S draw perpendiculars to the major axis meeting the ellipse in T and H. Through H draw the vertical line H I O, making H I equal to H G, and I O equal to T S; and taking T O as the major axis, describe the ellipse of ($\frac{2}{5}$) whose foci are U V. Through V draw V R horizontal, and through R draw R X vertical. The line K T H I O R is the section of the moulding, and R X the face of the antæ which it surmounts.

Figure 3 shows the various modes in which the curve of the inclined ellipse may be terminated in the construction of this moulding. In this way there may be constructed between the inclined ellipse of ($\frac{1}{3}$) and that of ($\frac{1}{6}$) and ($\frac{1}{2}$) 286 varieties as to curvature and direction, setting aside the various ways in which the curves of the three examples are ended. And this can be done without in any way diverging from the harmonic relation between the angles of curvature and of in-

clination, a variety amply sufficient for the Architect to select from according to his taste and judgment. (^{b})

THE CYMA RECTA.

This is one of the most beautiful compositions of the curve of the inclined ellipse, and the moulding may be constructed as follows :—

Let A B, figure 1, Plate X, represent the vertical depth of the intended moulding. Through B draw B F horizontal and equal to A B. Join A F, and bisect it in G. Draw A C, making the angle B A C ($\frac{1}{6}$). Draw H G P at right angles with A C. With A H and H G as semi-axes, describe the elliptic curve A G, and with P F and G P as semi-axes, describe the elliptic curve F G. Through the foci K and M draw K L and M N, and where these lines cut the circumference of the ellipses ends the curve of the cyma recta.

It will be observed that the curve of this moulding is that of the vertically* inclined ellipse of ($\frac{1}{3}$) and ($\frac{1}{6}$), while the direction of the moulding is that of ($\frac{1}{2}$). The varieties of the cyma recta that may be thus produced are as great as those of the ovolos. Figure 2 is another example, the curve being that of the inclined ellipse of ($\frac{3}{10}$) and ($\frac{1}{6}$), and the direction of the moulding ($\frac{1}{2}$).

THE HAWK'S BILL.

This moulding, figure 3, Plate X, is composed of the cyma recta and ovolo combined, thus :—Having described the curve of the cyma recta, bisect A H in O, and through O

* When the angle of inclination is less than 45° with the vertical line, the ellipse is vertically inclined ; when more, it is horizontally inclined.

draw O R at right angles with A H. Through R draw R S vertical, and R T at an angle of ($\frac{1}{3}$) with R S. Make R D equal to A H, and taking it as a semi-major axis, describe the elliptic curve of ($\frac{1}{3}$), T L R. In the Parthenon this moulding surmounts the enriched ovolo (fig. 2, Plate IX) in the capital of the antæ of the pronaos.

THE CYMA REVERSA, WITH THE PLINTH, CAVETTA, AND BEAD.

The cyma reversa, or ogie, as it is sometimes called, is another beautiful composition of the curve of the composite or inclined ellipse, and the moulding which it forms is of frequent occurrence in Grecian Architecture. Like the ovolo, it is generally accompanied with the plinth, the cavetta, or the bead, and sometimes with all three, as in the following example, which is constructed as follows:—Let P R, fig. 1, Plate XI, represent the vertical depth of the intended cyma reversa between the axes of its two elliptic curves. Through P and R draw P Q and R O horizontally. Through P draw P O at an angle of ($\frac{1}{3}$) with P R. Through R draw R Q at an angle of ($\frac{1}{3}$) with R P, and cutting P O in C. Bisect Q C in L, and C R in S, and join P L and S O. With P L and L C as semi-axes, describe the horizontal inclined elliptic curve of ($\frac{1}{3}$) C P H, whose superior focus will be F, and with S O and S C as semi-axes, describe the horizontally inclined elliptic curve of ($\frac{1}{3}$) C O. Through the focus F draw F G perpendicular to P Q, cutting the elliptic curve in H, and through H draw A M H E horizontally. Produce C P to M, and through M draw M B vertically. Produce C R to B, and through B draw B N horizontally, and the line H P C O N is the section of a cyma reversa or ogie moulding of ($\frac{1}{3}$) with its inclined plinth. To add the vertical plinths, cavetta, and bead, pro-

duce F H to K, making H K equal to ($\frac{1}{5}$) M B, and produce H K to G, making K G ($\frac{1}{2}$) H K. Through K and G draw horizontal lines K T and G V. Produce C P M to V, cutting K T in X; through V draw V T vertical, and through X draw X D U at an angle of ($\frac{2}{3}$) with X M P. With its major axis upon X U, and through T, describe an elliptic curve of ($\frac{1}{3}$), whose superior focus is D, and centre U, and the cavetta and vertical plinth which surmount the cyma reversa are proportionally formed. For the bead, produce O N to Y, and with a major axis upon N Y equal to ($\frac{1}{5}$) of the whole vertical depth, describe an elliptic curve of ($\frac{2}{5}$) and ($\frac{1}{3}$), with its circumference passing through N. Through its inferior focus Z draw Z I, horizontal, cutting the elliptic curve in I, and through I draw I J, vertical, cutting O Y in J. Through J draw J W horizontal, and equal to $\frac{1}{2}$ I J and draw W *a* vertical.

The cyma reversa is sometimes surmounted by a horizontal cavetta, as in fig. 2.

NOTES.

([a]) P.238. This figure I have elsewhere called the 'composite ellipse;' and, as stated in the text, it is composed of arcs of either ten or twelve ordinary ellipses. It may be described around any isosceles triangle by the following process:—Take the side of the triangle T G, figure 3, Plate VIII, as the major axis of an ellipse (which may either be that of ($\frac{1}{3}$), as in each of the examples given, or any of the smaller harmonic angles, and through T draw T *b*, making the angle of the required ellipse with T G. Bisect T G in *a*, and taking *a b* as a semi-minor axis, the foci will be found at A and B. Fix corresponding foci, C D F E, on the other side and base of the triangle. Fix a pin into each of those six foci, and one at the point *b*, and tie a thread tightly around them, using

a little wax to prevent the knot from slipping; when quite secure, remove the pin at *b*, and insert a pencil or any tracing point, and by moving it round the pins, and keeping the thread tight, the vertical composite ellipse of ($\frac{1}{3}$) will be described. In this figure N O and H S are arcs of horizontal ellipses, and H I, I K, K L, L M, and M N on the one side, and O P, P Q, Q U, U V, and R S on the other side, arcs of inclined ellipses, all harmonically blended. Between the isosceles triangles of ($\frac{1}{3}$) and ($\frac{1}{6}$) there are, inclusive, 22 of a harmonic kind, and an equal number of ellipses. Therefore, as these may be combined interchangeably, the variety of those figures between the angles of ($\frac{1}{3}$) and ($\frac{1}{6}$) amount to 484.

(^{b}) P. 241. The degrees of inclination employed in constructing an ovolo moulding between ($\frac{1}{2}$) and ($\frac{1}{3}$) being 13, and the ellipses 22, the variety of this moulding is 286, independently of that which arises from the various modes of terminating the curve of the inclined ellipse shown in figure 3, Plate IX.

END OF VOL. I.

PLATE VII.

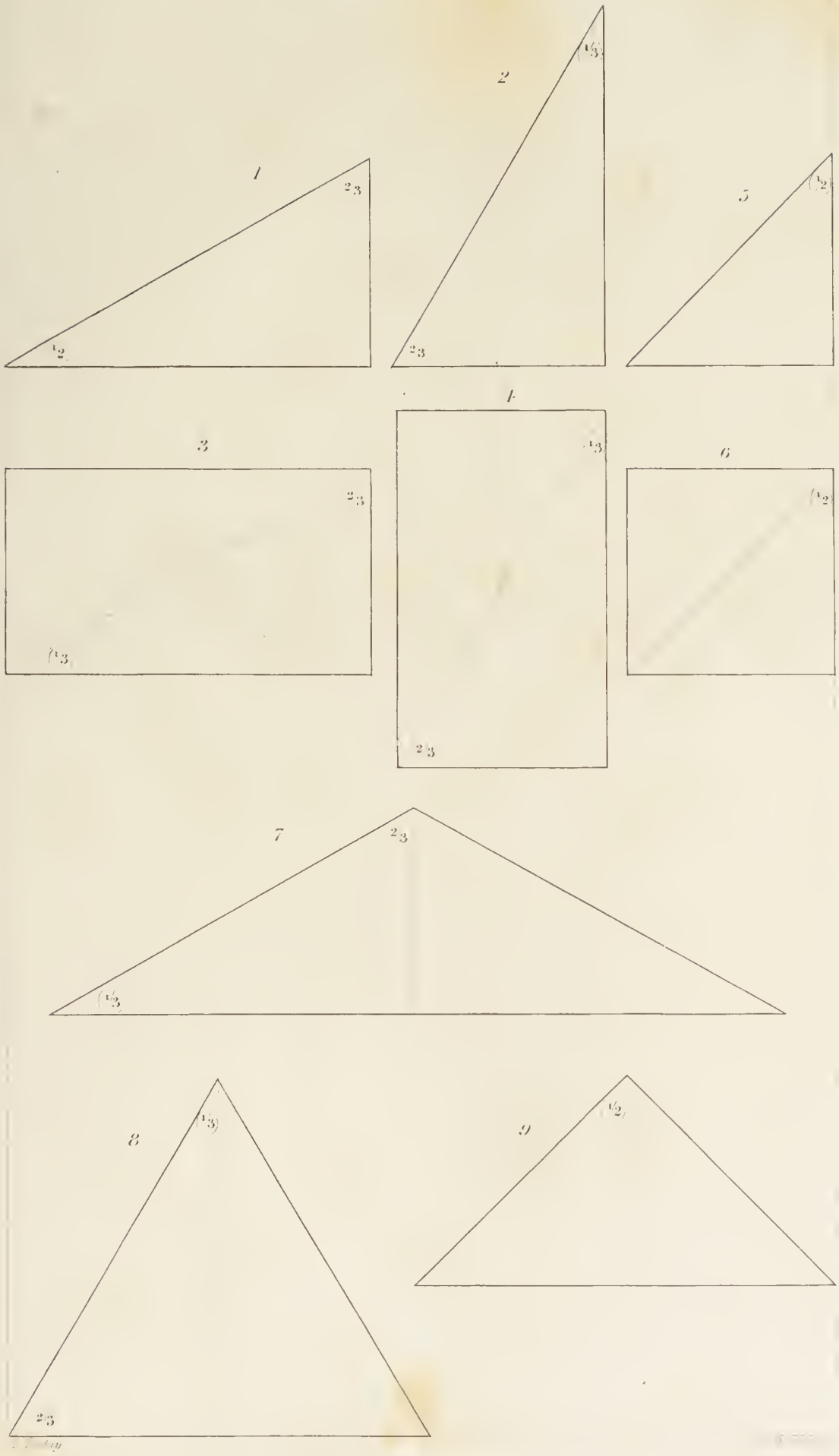


PLATE VIII.

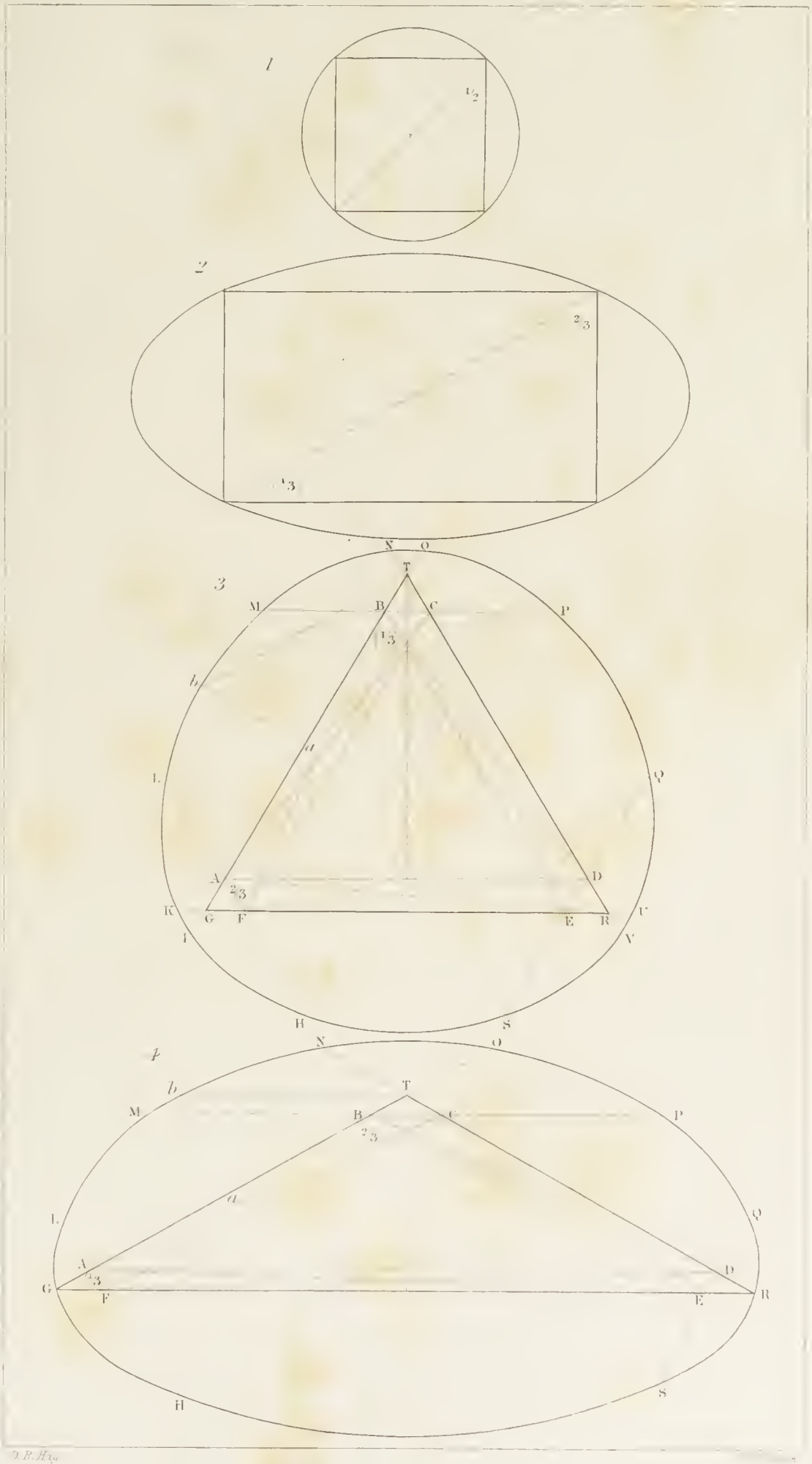


PLATE IX.

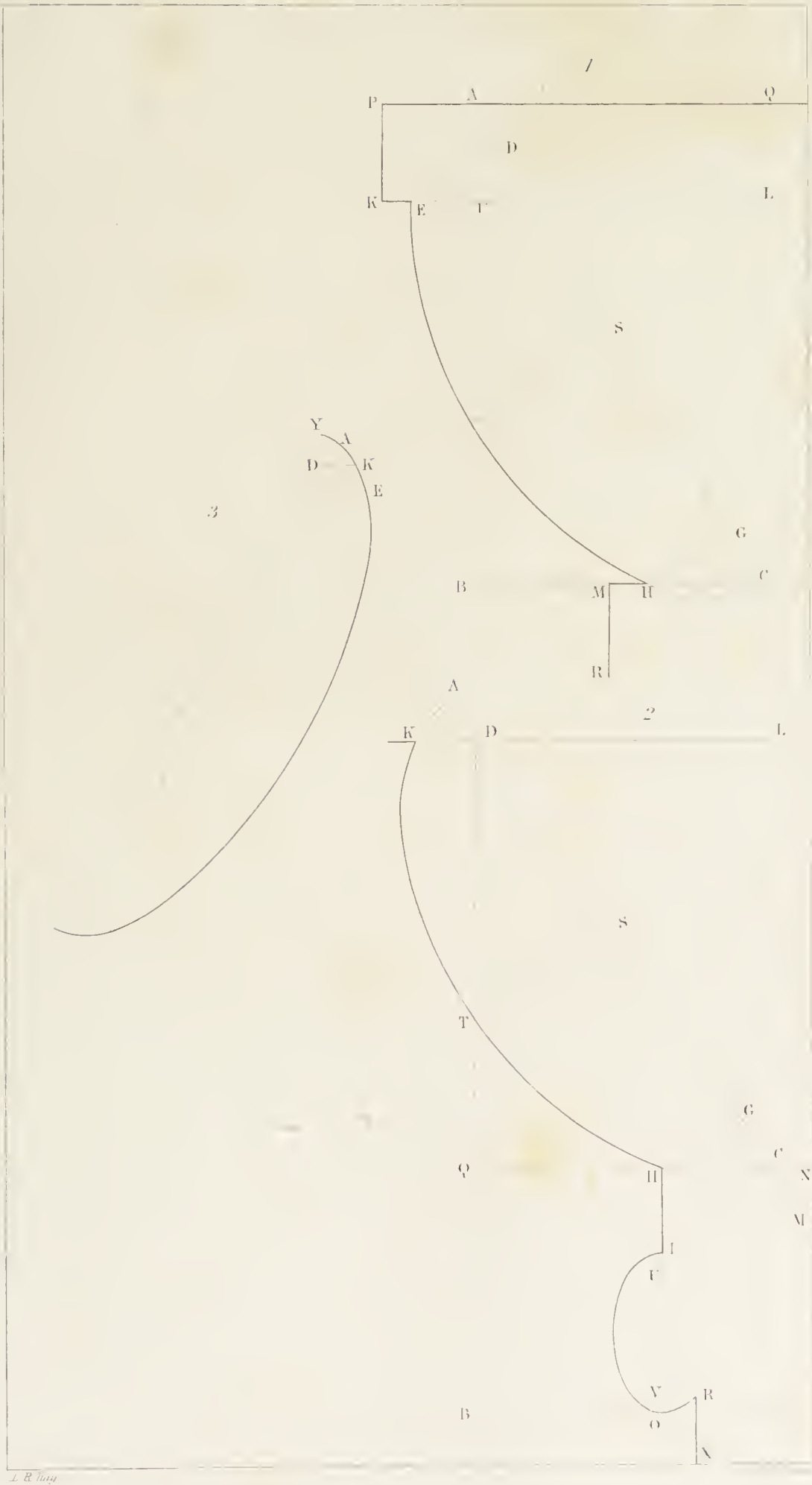


PLATE X.

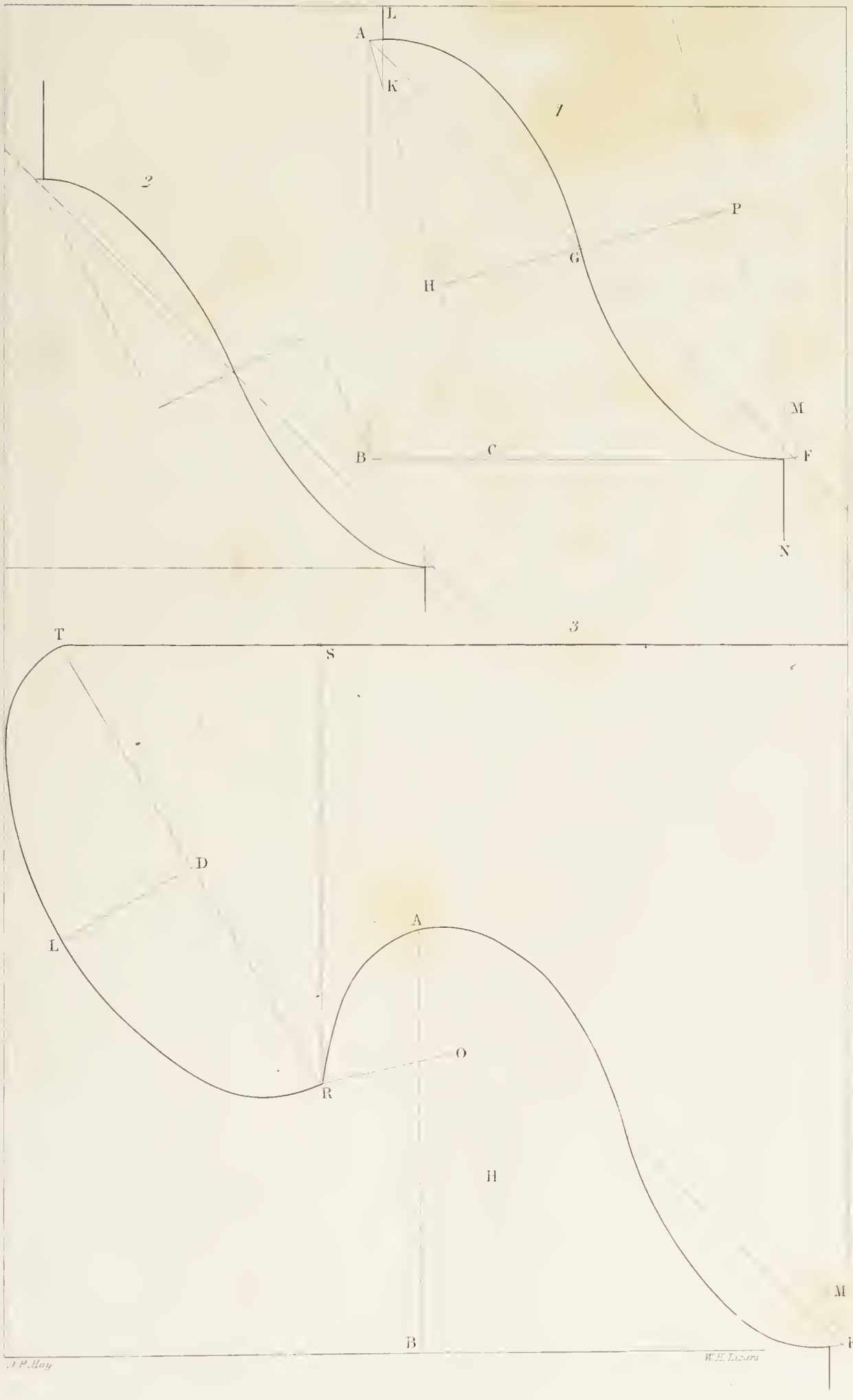
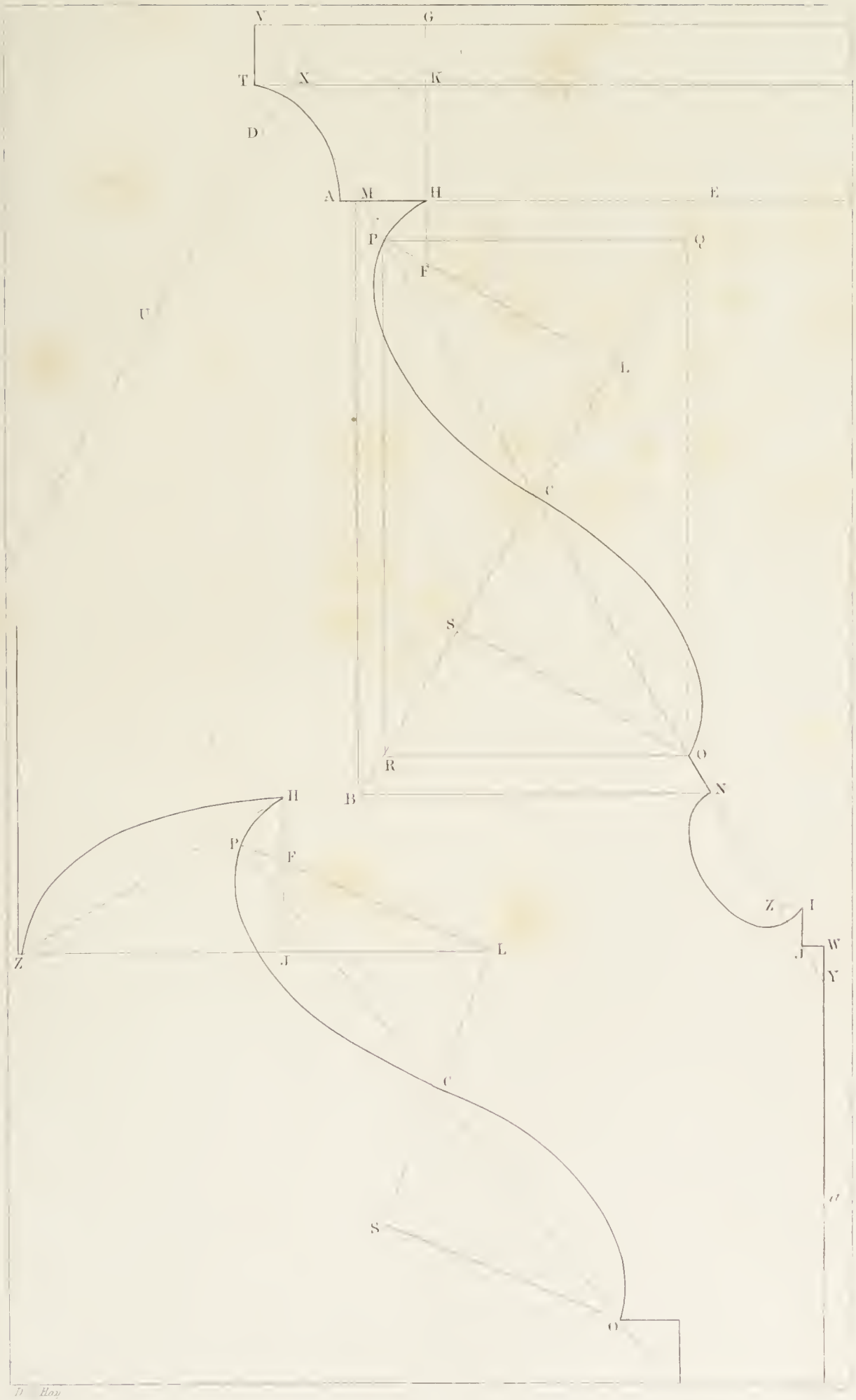


PLATE XI.



APPENDIX.

FIRST REPORT

OF THE

COUNCIL OF MANAGEMENT

OF THE

Architectural Institute of Scotland.

APPROVED OF AT THE ANNUAL GENERAL MEETING OF THE INSTITUTE ON 28TH NOVEMBER 1850.

EDINBURGH:
PRINTED BY W. BURNESS,
Printer to Her Majesty.

1850.

FIRST REPORT.

On the occasion of the First Annual General Meeting of the Architectural Institute of Scotland the Council are happy to have it in their power to congratulate the Members on the success which has attended the commencement of their labours, and the important position which, on its first public appearance, the Institute has been enabled to take among the institutions of the country.

Although the proceedings of this evening may be considered as the commencement of the regular business of the Institute, the Council of Management have nevertheless thought it incumbent upon them to submit their first Annual Report to this meeting, detailing the past progress of the Institute, and the various steps which have been taken to secure its efficient and permanent establishment.

At the general meeting of its promoters on 3d December 1849, the Architectural Institute of Scotland was constituted, *ad interim*, upon the basis of a body of laws which had been previously read to the meeting, under reservation of certain points in the constitution then submitted, for the consideration of which, and of the laws generally, a committee was appointed and invested with the usual powers of management.

The Interim-Committee of Management accordingly proceeded to revise and amend the laws so remitted to them, and they continued to direct the affairs of the Institute until the subsequent general meeting held on 17th April last, when, after hearing the report of the Committee, the Office-bearers of the Institute were appointed, and the meeting adopted, *inter alia,* the following resolution :—

> " That the meeting approve of the proceedings of the Committee of Management, who have taken the direction of the arrangements connected with the formation of the Institute, and also approve generally of the laws as framed by them, but remit the same to the Council now chosen, to consider and finally revise them previous to the meeting in November next."

In pursuance of the duties thus committed to them at the time of their election, the Council have had numerous meetings, and after correspondence, and various interviews with Architects, Builders, and others in Edinburgh, Glasgow, and elsewhere, they are now prepared to submit a carefully considered, and, as they trust, a sound and efficient body of laws for the final adoption of the Institute.

The first question which seriously engaged the attention of the Council was the subdivision of the Institute into various classes of membership. Before coming to any decision in this matter the Council thought it proper to take along with them in their deliberations various parties interested in the contemplated arrangements. The result has been the division of the Institute into the following classes of membership, each class being amenable to its own special bye-laws, in addition to the general laws of the Institute, viz. :—

1*st.* Fellows of the Institute, to which Architects alone shall be eligible.

2d. Associate-Builders of the Institute, to which Builders alone shall be eligible.

3d. Associate-Draughtsmen of the Institute, to which Architectural Draughtsmen, who have been seven years in an architect's office, shall alone be eligible.

4th. Ordinary Members of the Institute, comprehending all Members not eligible to any of the classes previously enumerated.

5th. Honorary Members of the Institute, being foreigners, upon whom the Institute shall confer Honorary Membership in respect of their professional attainments.

Architectural Draughtsmen who have not been seven years in an architect's office, and Architectural Students and Pupils, are eligible as Ordinary Members, but only until they shall be qualified to become Fellows or Associates.

The next subject of importance was the copyright of papers read before the Institute, and the right of the Institute to the use of illustrative models, plans, and drawings for the purposes of publication or otherwise. The decision of the Council upon these points is, that every paper read at a meeting of the Institute shall be considered its property, to the effect of enabling the Council to publish the same in the Transactions of the Institute at any time that they may think proper; and that the Institute shall be entitled to the use, for the purposes of publication or otherwise, of all models, plans, and drawings brought before them, for such a period as may be required by the Council, not exceeding six months.

The only other matter relating to the adjustment of the Laws, to which the Council think it necessary to allude, is a correspondence which has recently taken place with a Committee of the Architects of Glasgow, the result of which has been,

that certain arrangements have been effected to the satisfaction of all parties. As these arrangements, however, are subject to the approval of the Institute, they are here enumerated, in so far as they do not appear in the Laws appended to this Report:—

1. That of the twelve Members of the Institute who form the Council of Management, a certain number (the Committee suggest seven) shall be Fellows of the Institute. On this point the Council came to the resolution, that while they approve of the principle that a large proportion of the Council of Management should consist of Fellows of the Institute, they should reserve this matter, in the present state of the membership of the Institute, for future adjustment.

2. That the number of the Ordinary Councillors shall be increased to Twenty-four; and that a certain number of the stated General Meetings of the Institute shall be held in Glasgow.

3. That the special bye-laws applicable to the several classes of membership in the Institute shall not be circulated with the laws, but only printed on the formulas to be signed by the candidates previous to their admission.

The Council have farther to report, that, in virtue of the powers conferred upon them by Law 22 of the interim constitution, they appointed a Local Committee in Glasgow for the purpose of promoting the objects of the Institute in that city; and they have much pleasure in bearing testimony to the effectual services rendered to the Institute by the gentlemen who were appointed. They would recommend that a more extended Committee should be afterwards formed for the same purpose. The Council also contemplate the appointment of Local Committees in other towns in Scotland

where they may consider such an arrangement calculated to advance the interests of the Institute.

In terms of the resolutions adopted at last General Meeting, the financial existence of the Institute has only now commenced; and, in these circumstances, the Council have deferred making any permanent provision for the accommodation of the Institute, its library, museum, &c., until they can be guided in some degree by the receipts of the treasurer. They propose, therefore, that the meetings of this session, with the exception of such as shall be held in Glasgow, should take place at the Hopetoun Rooms, where accommodation has been secured on reasonable terms. At the same time, the Council would urge upon the Institute the necessity of providing suitable and permanent premises as soon as possible, as various donations have already been offered both to the library and the museum.

The Council take this opportunity of again impressing upon each individual Member the duty of interesting himself in the general welfare of the Institute, and of using his best endeavours to extend its numbers, so as to secure its efficiency, and put it in a position to carry out the important objects which it has in view. The Members are already aware, from the statement of the Council of Management, which has been extensively circulated, that the Institute proposes to carry out these objects by the establishment of a Library and Reading Room, and a Museum for the collection of Models and Designs—Meetings of the Institute for the reading of papers, and discussion on subjects connected with Architecture—Correspondence with Architects and Men of Science at home and abroad—and the publication of its proceedings. It has also in view the endowment of a Chair of Architecture, and the encouragement of Pupils of Merit at the various Scottish Schools of Art.

In conclusion, the Council have to acknowledge the assistance and encouragement they have at all times received from those gentlemen who have kindly lent their aid in maturing the arrangements which are now submitted and set forth in the amended constitution of the Institute. They have had great satisfaction in the cordiality and courtesy with which they have been met by all parties in their many interviews and communications on the subject of the Institute and its affairs; and so long as this disinterested regard for the advancement of Architectural Art shall continue to animate the various departments of this Institution, they entertain no fear of its prosperity and permanency. They are persuaded that in Architecture—an art at once historical and creative, rich in resources, and ever responsive to the varying habits and increasing wants of civilized life—there is no inherent finality; and that while a miscellaneous criticism may have its advantages in deterring the unskilful, and in repressing what is faulty or extravagant, it is only by the enlightened combination of well-qualified and competent minds in every department of architectural knowledge, that this science, in which pre-eminently the artistic and the practical are combined in equal and mutual dependence, can be carried out progressively to its highest and happiest results.

In name of the Council of Management,

CHARLES BAILLIE, *Chairman.*
W. A. PARKER, *Secretary.*

EDINBURGH, 28*th November* 1850.

LAWS AND BYE-LAWS

OF THE

ARCHITECTURAL INSTITUTE

OF SCOTLAND.

CONSTITUTED 28TH NOVEMBER 1850.

EDINBURGH:
PRINTED BY W. BURNESS,
Printer to Her Majesty.

1850.

OFFICE-BEARERS AND COUNCIL OF MANAGEMENT FOR 1850–51.

PRESIDENT.

His Grace the Duke of Buccleuch and Queensberry.

VICE-PRESIDENTS.

His Grace the Duke of Roxburghe.
The Most Hon. the Marquis of Breadalbane.
The Right Hon. the Earl of Morton.
The Right Hon. the Earl of Haddington.
The Right Hon. the Earl of Aberdeen.
The Right Hon. the Earl of Rosebery.

COUNCILLORS.

Thomas Grainger, Esq., C.E., Edinburgh.
Lieutenant-Colonel M'Niven.
Alexander Maconochie, Esq., of Meadowbank.
The Very Reverend Edward B. Ramsay.
David Rhind, Esq., Architect, Edinburgh.
Joseph Robertson, Esq.
George Smith, Esq., Architect, Edinburgh.
Archibald Alison, Esq., Sheriff of Lanarkshire, President of the Glasgow Committee.
Charles Wilson, Esq., Architect, Glasgow.
James Smith, Esq,, Architect, Glasgow.
Charles Baillie, Esq., Advocate.
The Reverend Dr Grant, of St Mary's.
J. A. Bell, Esq., Architect, Edinburgh.
A. Forbes Irvine, Esq., younger of Drum, President of the Aberdeen Committee.
James Dunlop, Esq., Glasgow.
Thomas Brown, Esq., Architect, Edinburgh.
James Salmon, Esq., Architect, Glasgow.
Archibald M'Lellan, Esq., Glasgow.

HONORARY SECRETARY.

William A. Parker, Esq., Edinburgh.

HONORARY SECRETARY FOR PROFESSIONAL CORRESPONDENCE.

J. Dick Peddie, Esq., Architect, Edinburgh.

HONORARY TREASURER.

John Kirk, Esq., W.S., Edinburgh.

AUDITORS.

James Wilkie, Esq., Accountant, Edinburgh.
David Cousin, Esq., Architect, Edinburgh.

Glasgow Committee.

PRESIDENT.

Archibald Alison, Esq., Sheriff of Lanarkshire.

VICE-PRESIDENTS.

The Honourable Sir James Anderson, Lord Provost.
H. G. Bell, Esq., Advocate.
Alexander Hastie, Esq., M.P.

MEMBERS OF COMMITTEE.

John Strang, Esq., LL.D.
John Herbertson, Esq., Architect.
John Houldsworth, Esq.
James Salmon, Esq., Architect.
John Tennant, Esq. of St Rollox.
J. T. Rochead, Esq., Architect.
William Broom, Esq.
William Clark, Esq., Architect.
John Graham Gilbert, Esq., R.S.A.
John Burnett, Esq., Architect.
John Mossman, Esq.
James Smith, Esq., Architect.

HONORARY SECRETARY AND PROFESSIONAL CORRESPONDENT.

Charles Wilson, Esq., Architect, Glasgow.

LAWS AND BYE-LAWS

OF THE

ARCHITECTURAL INSTITUTE OF SCOTLAND.

1. The object of the Institute shall be the advancement of the Art and Science of Architecture.

2. The Institute shall consist of five classes of members, viz., Fellows, Associate-Builders, Associate-Draughtsmen, and Ordinary and Honorary Members. Architects shall be eligible only as Fellows, Builders only as Associate-Builders, and Architectural Draughtsmen who have been seven years in an architect's office, only as Associate-Draughtsmen. Candidates not eligible as Fellows, Associate-Builders, or Associate-Draughtsmen, shall be admitted as Ordinary Members. Architectural Draughtsmen, who have not been seven years in an architect's office, and Architectural Students and Pupils, shall be admitted as Ordinary Members, but only until they shall become eligible as Fellows or Associates. It shall be competent for the Institute, upon the recommendation of two-thirds of the Council, to confer Honorary Member-

ship upon Foreigners distinguished by their professional attainments.

3. The office-bearers of the Institute shall consist of a President, six Vice-Presidents, two Secretaries, and a Treasurer, who, with twenty-four other members of the Institute, shall form the Council of Management. Five of the Council shall be a quorum. One of the Secretaries shall be an Ordinary Member, the other a Fellow. The Council shall have power to appoint a Librarian and other subordinate officers.

4. Candidates for admission shall be recommended in writing by two members.

5. Applications for admission shall not be disposed of until the meeting after that on which they are given in.

6. Members shall be elected by ballot at a meeting of the Institute; and the proportion of votes requisite for their election shall be four-fifths of the ballot.

7. Candidates for admission as Fellows shall be required to sign the formula contained in the Appendix (A.), and Candidates for admission as Associate-Builders shall be required to sign the formula contained in the Appendix (B.)

The Bye-laws applicable to Fellows and Associate-Builders of the Institute are printed on the respective Formulas to be signed by them as Candidates for admission.

8. Any Associate-Builder or Associate-Draughtsman who shall, subsequently to his election, practise as an

architect on his own account, shall cease to be an Associate-Builder or Associate-Draughtsman, and on signing the formula in the Appendix (A) be admitted *de plano* as a Fellow of the Institute ; and any Ordinary Member who shall, subsequently to his election, practise as an architect or builder on his own account, shall cease to be an Ordinary Member, and, on signing the appropriate formula in the Appendix, shall in like manner be admitted as a Fellow or Associate-Builder, as the case may be.

9. The President of the Institute shall be elected for three years ; two of the Vice-Presidents and one-fourth of the ordinary Councillors shall retire annually by rotation, and the Secretaries and Treasurer shall be elected annually, at the Annual General Meeting of the Institute, all office-bearers being eligible for re-election.

10. One Fellow and one Ordinary Member shall be annually appointed as Auditors, to audit the accounts of the Institute, and report thereon to the Annual General Meeting.

11. Members shall pay an annual contribution of One Guinea ; but they may compound for their annual payments by a single payment of Ten Guineas, or any time within five years by paying the balance of that sum, after deduction of the previous annual payments ; and at the expiry of five years, and after, by a payment of Five Guineas.

12. The subscriptions shall be payable in advance on the 1st day of November annually ; and at whatever period

of the year a Member shall be admitted, he shall pay the full current year's subscription.

13. When any Member shall be two years in arrear of his annual subscription, and shall not have paid on application of the Secretary, the fact shall be notified at the next meeting of the Institute.

14. The Council shall annually draw up a Report on the affairs of the Institute, which shall be submitted to the Annual General Meeting, and circulated.

15. The Secretaries, in addition to their ordinary duties, shall have the charge, under the direction of the Council, of printing and publishing the transactions and papers of the Society.

16. Every paper read at a meeting of the Institute shall be considered its property, to the effect of enabling the Council to publish the same in the Transactions of the Institute at any time that they may think proper.

17. The Institute shall be entitled to the use, for the purposes of publication or otherwise, of all models, plans, and drawings brought before them, for such a period as may be required by the Council, not exceeding six months.

18. None but Members shall be allowed to attend the meetings of the Institute, except upon an order signed by a member of Council, or when introduced personally by a Member of the Institute.

19. The Annual General Meeting of the Institute shall be held on the last Thursday of November, to receive and deliberate upon the Report of the Council, and to elect the Office-Bearers for the ensuing year. The Session of the Institute shall commence on the last Thursday of November, and terminate on the last Thursday of March; and the stated Meetings shall be held on the second and last Thursdays of each month during the Session.

Notices of the Meetings of the Institute, and of the business to be transacted at them, shall be sent to all the Members.

20. The Council shall, when they consider it expedient to propose the enactment of any new law, or the alteration or repeal of any existing one, summon a Special General Meeting of Members to decide on the same. The Council may also call a Special General Meeting at any time during the session for any other purpose.

21. The Council shall be bound to call a Special Meeting of the Institute on a requisition signed by eight Members.

22. No alteration of the Laws shall be made without the consent of two-thirds of the Members voting, and notice of any alterations must be intimated to the Council at least a month previous to the Annual General Meeting, so that, should the Council not see fit to call a Special Meeting for its consideration, it may be disposed of at the Annual General Meeting.

23. The Council shall have the power, except where otherwise provided, of appointing Committees, chosen

either from their own body, or from among the Members of the Institute, for the purpose of investigating specific subjects, and the Reports of such Committees shall be submitted to, and approved of by the Council previously to their being read to the Institute.

24. The Council shall have power to make such regulations for carrying into effect the Laws, and for the general management of the affairs of the Institute, as circumstances shall from time to time, in their opinion, render necessary, to be reported at the next Annual General Meeting.

Local Committees appointed in virtue of the powers contained in Law 24 shall be bound to transmit to the Secretary a Report of their proceedings at least ten days previous to the Annual General Meeting, accompanied by any accounts of expenditure which may have been necessarily incurred by them in promoting the objects of the Institute, duly vouched, and made up and closed as at the date of transmission, in order that the same may be submitted to the Council, and the accounts audited, in time for the Council's Annual Report.

25. Voting by proxy on subjects specified therein, shall be allowed at the Meetings of the Institute; but no Member shall be permitted to hold more than three proxies.

APPENDIX (A.)

I hereby declare that I follow exclusively the profession of an Architect, and that solely as a principal, not as subordinate to another. And having read the Laws and Bye-Laws of the Architectural Institute of Scotland, I hereby request the honour of being admitted a Fellow of the Institute.

APPENDIX (B.)

I hereby declare that I follow the trade of a Builder, and that solely as a principal, and not as subordinate to another. And having read the Laws and Bye-laws of the Architectural Institute of Scotland, I hereby request the honour of being admitted an Associate-Builder of the Institute.

ROLL OF MEMBERS

OF THE

ARCHITECTURAL INSTITUTE OF SCOTLAND.

ORIGINAL MEMBERS.

Aberdeen, The Right Honourable the Earl of.
Adam, Alexander F., W.S., Edinburgh.
Adam, James, S.S.C., Edinburgh.
Alexander, John, Builder, Fountainbridge, Edinburgh.
Alexander, William, architect, Ayr.
Alison, Archibald, Sheriff of Lanarkshire, President of the Glasgow Committee.
Anderson, Edmund, Edinburgh.
Anderson, Hon. Sir James, Lord Provost of Glasgow.
Arnot, Reverend Dr, Edinburgh.

Buccleuch and Queensberry, His Grace the Duke of.
Breadalbane, The Most Honourable the Marquis of.
Baillie, Charles, advocate, Edinburgh.
Baird, John, architect, Glasgow.
Baird, John, architect, Glasgow.
Ballantine, James, 42 George Street, Edinburgh.
Beattie, George, builder, Edinburgh.

Beattie, William, Convener of Trades of Edinburgh.
Bell, George, architect, Glasgow.
Bell, Henry G., advocate, Sheriff-Substitute of Lanarkshire, Glasgow.
Bell, J. A., architect, Edinburgh.
Bennett, John B., 50 Gordon Street, Glasgow.
Binnie, George, Union Street, Glasgow.
Black, Alexander, architect, Edinburgh.
Black, Robert, architect, Glasgow.
Blaikie, Anthony A., advocate, Aberdeen.
Boyle, Archibald T., advocate, Edinburgh.
Broom, William, builder, Glasgow.
Brown, James, architect, Glasgow.
Brown, John, M.D., Edinburgh.
Brown, Thos., architect, Edinburgh.
Brown, Thomas, 137 Bath Street, Glasgow.
Brownlie, Thomas, builder, Cumberland Street, Glasgow.
Bryson, A., 66 Princes Street, Edinburgh.
Bryson, R., Junior, 66 Princes Street, Edinburgh.
Burnet, John, architect, Glasgow.
Burnett, George, advocate, Edinburgh.
Burnley, William F., 151 W. George Street, Glasgow.

Calder, John Moore, 3 Windsor Place, Glasgow.
Campbell, John Archibald, Sheriff-clerk of Mid-Lothian, Edinburgh.
Campbell, Sir James, of Stracathro, Glasgow.
Campbell, William, of Tillichewan, Glasgow.
Carrick, John, architect, Glasgow.
Christie, Alex., 20 Forth Street, Edinburgh.
Clarke, Wm., architect, Glasgow.

Cogan, Hugh, 78 Ingram Street, Glasgow.
Colquhoun, Sir James, of Colquhoun and Luss, Bart.
Connal, William, Dean of Guild, Glasgow.
Couper, John, M.D., Moore Place, Glasgow.
Cousin, David, architect, Edinburgh.
Cousin, George, surveyor, Edinburgh.
Cowan, Charles, M.P., Edinburgh.
Cox, Robert, W.S., Edinburgh.
Crum, H. E., George Square, Glasgow.

Dallas, E. W., 31 India Street, Edinburgh.
Donaldson, John, advocate, Professor, Edinburgh University.
Dundas, William P., Deputy Clerk Register, Edinburgh.
Dunlop, Alex., of Clober, Edinburgh.
Dunlop, James, Clyde Iron Works, Glasgow.

Ewart, William, M.P., London.

Ferguson, Lieut.-Col. James, 6 Dundas Street, Edinburgh.
Ferguson, W. B., C.E., 129 Union Street, Aberdeen.
Forman, John N., W.S., Edinburgh.

Gibson, John, W.S., Edinburgh.
Gilbert, John Graham, R.S.A., P.W.S.A., Glasgow.
Gordon, Charles Napier, Hallhead.
Gordon, John Thomson, Sheriff of the County of Edinburgh.
Gordon, William, builder, 5 Lothian Road, Edinburgh.
Gourlay, James, Princes Square, Glasgow.
Gowans, James, Builder, Edinburgh.

Grainger, Thomas, C.E., Edinburgh.
Grant, Rev. Dr., of St Mary's, Edinburgh.

Haddington, the Right Hon. the Earl of.
Haddo, The Right Honourable Lord.
Haden, George, 6 St Andrew Square, Edinburgh.
Hall, Sir John, Bart. of Dunglass, Cockburnspath.
Hannah, Rev. John, 60 Great King Street, Edinburgh.
Hannan, James, 12 Elmbank Crescent, Glasgow.
Harvey, Thomas, B.A., Oxon., Edinburgh Academy.
Hastie, Alex., M.P., Glasgow.
Hay, D. R., George Street, Edinburgh.
Henderson, John, architect, Edinburgh.
Henderson, William, builder, Aberdeen.
Herbertson, John, architect, Glasgow.
Hill, D. O., R.S.A., Edinburgh.
Hope, James, D.K.S., Edinburgh.
Horne, James, C.E., Edinburgh.
Houldsworth, John, Cranston Hill, Glasgow.
Howatt, James, Miller Street, Glasgow.
Hutchison, John, builder, Edinburgh.

Inglis, C. Halket Craigie, of Cramond, Edinburgh.
Innes, Cosmo, advocate, Edinburgh.
Irvine, A. Forbes, Younger of Drum, President of the Aberdeen Committee.
Ivory, Honourable Lord, Ainslie Place, Edinburgh.

Jamieson, David, Edinburgh.
Jenner, Charles, 47 Princes Street, Edinburgh.
Johnston, The Rt. Hon. Wm., Lord Provost of Edinburgh.

Kennedy, John, Junior, W.S., Edinburgh.
Kinnear, C. G. H., 125 Princes Street, Edinburgh.
Kirk, John, W.S., Edinburgh.
Kirkland, Alexander, architect, Glasgow.
Kyle, Thomas, Esq., land surveyor, 40 St Vincent Place, Glasgow.

Laidlaw, David, 16 Buchanan Street, Glasgow.
Lamond, Robert, 29 St Vincent Place, Glasgow.
Leadbetter, Charles, Edinburgh.
Lessels, John, architect, Edinburgh.
Liddell, Andrew, Esq., Plean House, Stirlingshire.
Lind, David, builder, 1 S. Charlotte Street, Edinburgh.
Lindsay, Robert, builder, 169 Hill Street, Glasgow.
Low, David, Professor of Agriculture, Edinburgh University.
Lumsden, James, jun., 20 Queen Street, Glasgow.

Morton, The Right Honourable the Earl of.
Macandrew, John, jun., S.S.C., Edinburgh.
Macdonald, A. G., 57 Buchanan Street, Glasgow.
Macindoe, George Park, 44 St Vincent Place, Glasgow.
Mackenzie, John Whitefoord, W.S., Edinburgh.
Maclure, Dr, Saxe-Coburg Place, Edinburgh.
Maconochie, Alex., of Meadowbank.
Mackonochie, J., advocate, Edinburgh.
M'Callum, Duncan, C.E., Edinburgh.
M'Clelland, James, 128 Ingram Street, Glasgow.
M'Gibbon, Charles, builder, 33 East Claremont Street, Edinburgh.
M'Gibbon, John, builder, 40 Great King St., Edinburgh.

M'Lellan, Archibald, 66 Howard Street, Glasgow.
M'Niven, Lieut.-Colonel, of Tusculum, Musselburgh.
Miller, James, 94 Nelson Street, Glasgow.
Mossman, John, 83 North Frederick St., Glasgow.
Munro, Alex., architect, Glasgow.
Murray, Honourable R. Dundas, Edinburgh.
Murray, John, of Murrayshall, advocate, Edinburgh.
Murray, W. H., advocate, Edinburgh.
Murray, William, of Henderland, Edinburgh.

Napier, Robert, Lancefield, Glasgow.
Neilson, Wm., builder, St George's Road, Glasgow.

Parker, John, Principal Extractor Court of Session, Edinburgh.
Parker, William A., General Register House, Edinburgh.
Paterson, Geo., builder, 14 Montgomery St., Edinburgh.
Peddie, J. Dick, architect, Edinburgh.
Peddie, Rev. Dr., George Square, Edinburgh.
Peddie, James, C.E., Edinburgh.
Playfair, James, 75 West Nile Street, Glasgow.
Purdie, Thomas, 60 Hanover Street, Edinburgh.

Roxburghe, His Grace the Duke of.
Rosebery, the Right Honourable the Earl of.
Rait, D. C., Glasgow.
Ralston, A. Macdougall, of Warwick Hill, Ayrshire.
Ramage, William, architect, Aberdeen.
Ramsay, David, 30 St Enoch's Square, Glasgow.
Ramsay, the Very Rev. Edward B., Edinburgh.
Ramsay, Sir James, Bart., of Balmain.

Reid, C. G., W.S., Edinburgh.
Rhind, David, architect, Edinburgh.
Ritchie, A. Handyside, sculptor, Princes St., Edinburgh.
Ritchie, Robert, C.E., Assoc. Inst. C.E.
Ritchie, Walter, 37 Tolbooth Wynd, Leith.
Robb, John, builder, 22 Barony Street, Edinburgh.
Robertson, Joseph, Edinburgh.
Rochead, J. T., architect, Glasgow.
Rogers, Alexander, Cassels Place, Leith.
Ruskin, John.
Ruthven, James, architect, Edinburgh.

Salmon, James, architect, Glasgow.
Scarth, Pillans, W.S., Leith.
Scott, Archibald, architect, Edinburgh.
Scott, James, 16 Woodside Crescent, Glasgow.
Seton, George, advocate, Rutland Square, Edinburgh.
Smith, Alexander, C.E. and surveyor, 129 Union Street, Aberdeen.
Smith, George, architect, Edinburgh.
Smith, James, architect, Glasgow.
Smith, Rev. R. Payne, of Trinity Chapel, Edinburgh.
Spence, Wm., architect, Glasgow.
Stewart, Sir M. R. Shaw, of Greenock and Blackhall, Bart.
Stevenson, Rev. R. H., of St George's, Edinburgh.
Stevenson, Thomas, C.E., Edinburgh.
Strang, John, LL.D., Glasgow.

Taylor, Jas., builder, 6 Main St., Anderston, Glasgow.
Taylor, John, Assembly Rooms, Edinburgh.

Tennant, John, of St Rollox, Glasgow.
Terrot, the Right Reverend Bishop, Edinburgh.
Thomson, A., architect, Glasgow.

Veitch, Rev. James, of St Cuthberts, Edinburgh.

Wardrop, Maitland, architect, Edinburgh.
Wilkie, James, accountant, Edinburgh.
Wilson, Andrew, 18 Leven Street, Edinburgh.
Wilson, Charles, architect, Glasgow.
Wilson, John, of Dundyvan, Glasgow.
Wilson, John, of Aucheniden, 7 Moore Place, Glasgow.
Wilson, Patrick, architect, Edinburgh.
Wright, Robert, architect, Edinburgh.
Wylie, Henry J., C.E., Dublin Street, Edinburgh.

York, William, Deacon Convener of the Trades' House, Glasgow.
Young, Archibald, advocate, Edinburgh.

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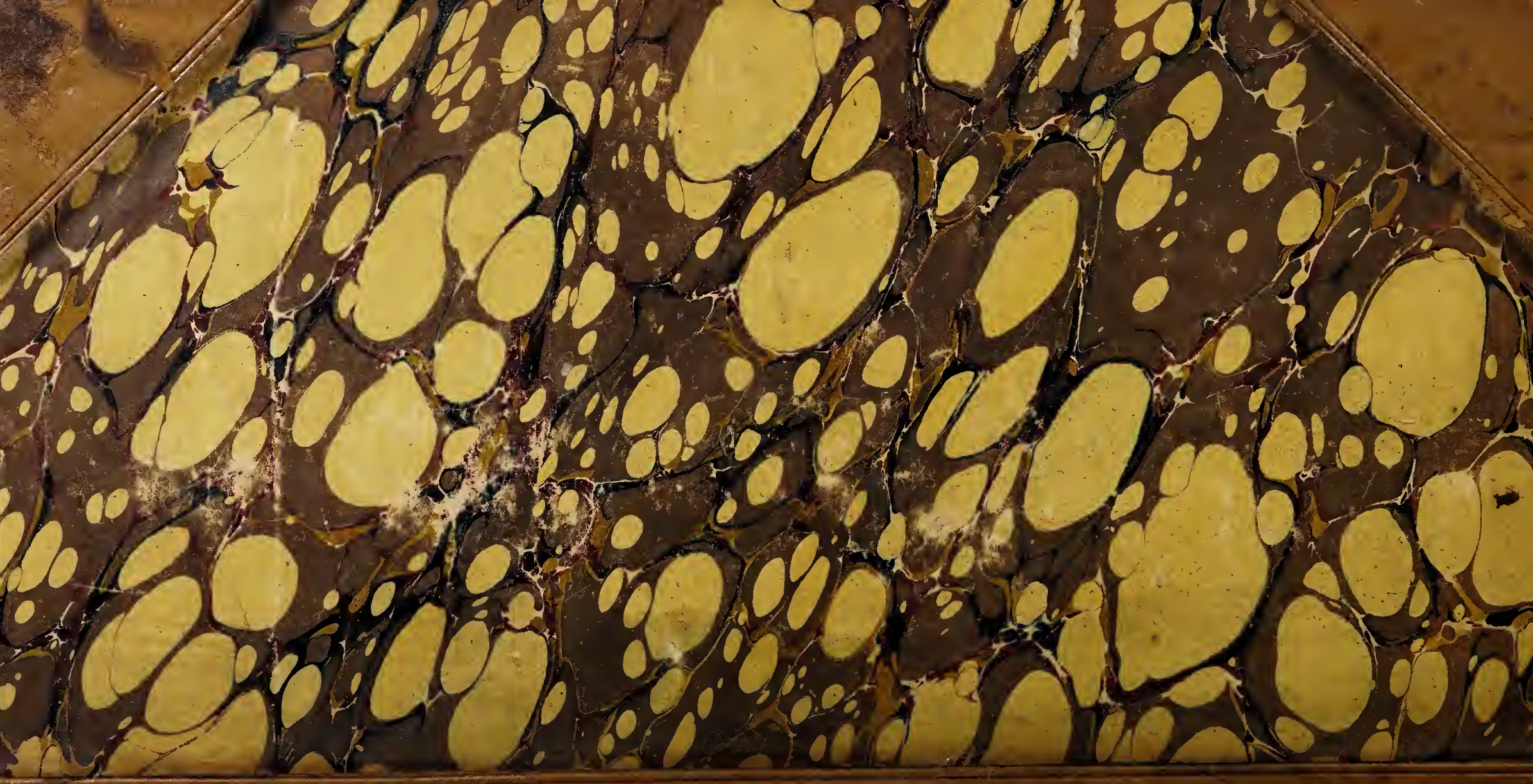
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